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ABSTRACT

The annual report on achievement testing in Alberta (Canada) includes test results for third-grade students in language learning (for the regular English program), sixth-grade students in social studies, and ninth-grade students in science. Results are regarded in terms of curriculum standards, assessment standards, and achievement standards. School-level results for the 102,702 students who took the tests (about 84% of total students) suggest declining performance across grades 3, 6, and 9. In fact, a satisfactory percentage of ninth graders met the achievement standard in only two of three schools. The assessments this year included performance tasks at each grade level. Grade 3 results indicate that fewer students meet the provincial standards on the performance test than on the written component of the achievement test. Seventeen figures and 43 tables present test results for the 3 grades. Five appendixes discuss standards, interpretation of results, and details of test construction, and list questions parents frequently ask. A questionnaire about the report is included for reader feedback. (SLD)

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ED 378 203

Achievement Testing Program Provincial Report

June 1993 Administration

Grade Level 3 Language Learning
Grade 6 Social Studies
Grade 9 Science

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Students First!
Student Evaluation

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Alberta
EDUCATION

Achievement Testing Program Provincial Report

June 1993 Administration

Alberta Education
Student Evaluation Branch

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This document was written primarily for:

Students	
Teachers	✓
Administrators	✓
Parents	
General Public	
Others (Specify)	Researchers

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Message from the Director

I am pleased to present the annual report on provincial achievement testing for the June 1993 administration. Students were assessed in Grade 3 language learning, Grade 6 social studies, and Grade 9 science.

As in past years, the information in this report is based only on the students in the province who were assessed. However, approximately 10 percent of the students in each grade did not write the test (page 1), so we have no information about these students' achievement in relation to provincial standards. Beginning in the 1994–95 school year, all students registered in grades 3, 6, and 9 programs are expected to write the tests or be reported as not being able to achieve standards. Following the 1995 adminstration, we will be able to provide more comprehensive information to schools and to report to the public on the achievement of all students, but our new inclusion policy is likely to affect the percentage of students who meet provincial standards.

School level results suggest declining performance across grades 3, 6, and 9 as evident in the percentage of schools meeting the provincial achievement standard. As shown on page 56, Grade 9 level data show that a satisfactory percentage of students met the achievement standard in only two out of three schools. This indicates that not enough Grade 9 students know their science in one-third of our schools. The information in this report, together with detailed school data provided separately, should help school administrators, teachers, and the community to identify what needs to be done to improve learning in their schools.

Again this year, the assessments included performance tasks at each grade level. These tasks extend the range of areas assessed and generally raise additional questions of importance for classroom instruction. For example, the Grade 3 results, presented in Section 2, show that fewer students clearly met the provincial standard for writing in the performance assessment than on the written component of the achievement test. This type of extended writing task may be more useful in the context of classroom assessment, as a means of gaining insights about a student's learning processes in writing for diagnostic purposes, since it does not add much to the measure of student's writing competence at the end of Grade 3.

As part of the 1993 testing, a special study was done with students aged 9 to investigate the merit of age-based testing. The study included a survey of teachers on the desirability of assessment by age. Although the results show some useful information about age and grade level performance, assessment by age proved disruptive for some schools. The study supports our decision to continue with our grade-based approach to assessment. See Section 9 for more detail.

The provincial assessments and special studies can only be carried out with the help of teachers, principals, and superintendents. On behalf of the staff at the Student Evaluation Branch, I want to express our appreciation for this help. I trust that the enclosed report will be interesting to all of you, and I hope it will assist you in reflecting on your instructional programs and encouraging all students to meet high standards of achievement. A questionnaire is included at the end of the report, and we welcome your feedback.

Horvath

Frank G. Horvath, Director

Section 1

Summary of Achievement Test Results

Parents, educators and the general public need to know how well Alberta students are achieving in relation to provincial standards.

The 1993 achievement test results* show what students in grades 3, 6, and 9 know and can do in Grade Level 3 Language Learning, Grade 6 Social Studies, and Grade 9 Science.

> Knowledge of what is possible produces new enthusiasm, raises sights, establishes new challenges and ultimately can improve personal and societal performance.**

This first section of the report describes certain broad characteristics of the student population who wrote the achievement tests and provides answers to the following questions:

- How many students wrote the achievement test for their grade and how does this compare to 1992?
- What percentage of the students achieved the acceptable standard according to criteria set by Alberta Education?
- What percentage of the students achieved the standard of excellence according to criteria set by Alberta Education?

Student Participation

How many students wrote the achievement test for their grade and how does this compare to 1992?

In June 1993, principals reported a total population of 116 296 students in the grades tested. There were 42 837 students in Grade 3, 39 097 students in Grade 6, and 34 362 students in Grade 9. Of the total population, 102 702 wrote achievement tests. This means that 88.3% of students reported by principals to be enrolled in schools in June wrote the tests. The remaining 13 594 students were exempted from writing or were absent the day the tests were administered.

Figure 1-1 shows student participation data for June 1993 and for June 1992. This report does not take these absent or exempted students into account in answering the questions about the percentage of students who achieved the *acceptable standard* and the *standard of excellence*.

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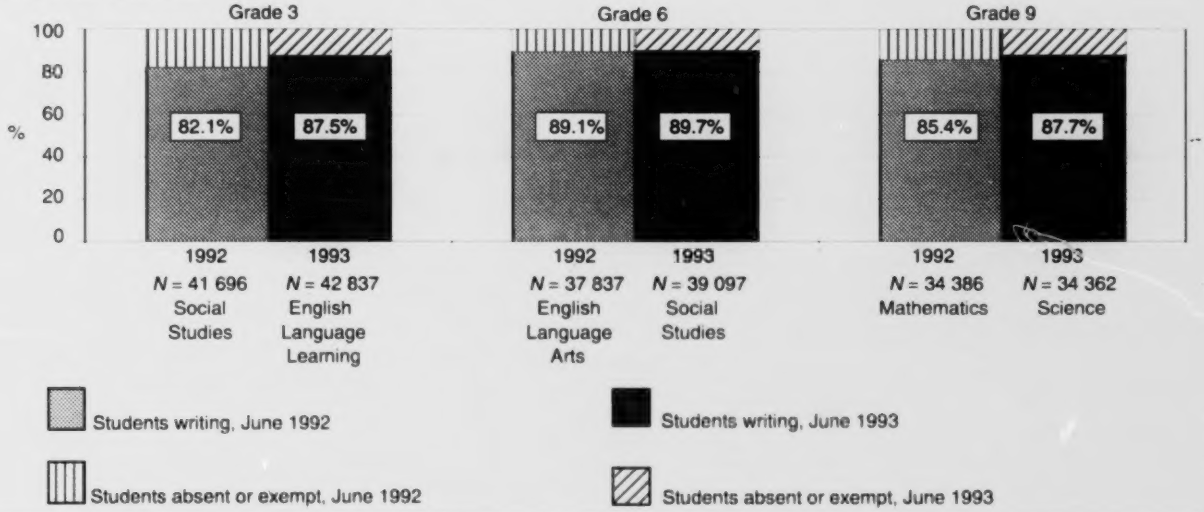
*In some cases, the percentages in a chart may not add to 100 because of rounding.

** Learning Mathematics/Learning Science, International Assessment of Educational Progress, Educational Testing Service, February 1992.

Figure 1-1
Student Participation in Achievement Tests*
June 1992 and June 1993



*The number of students writing the tests includes students in the regular English program, and Francophone and French Immersion students who wrote the achievement test either in English or in French translation.
N = number of students reported by principals to be enrolled in June.

Observations and Discussion

In 1993, the percentage of students who wrote the test was close to 90% for each of the three grades. The percentage for Grade 6 was the highest (89.7%) compared to 87.5% for Grade 3 and 87.7% for Grade 9.

In terms of absolute numbers, Grade 3 had the highest number of students (37 500) writing the test, followed by students in Grade 6 (35 062) and students in Grade 9 (30 140). This trend corresponds with the trend in student enrollment by grade reported as of September 30.

The total number of grades 3, 6, and 9 students who wrote the tests increased from 97 315 in 1992 to 102 702 in 1993. This represents an increase of 5.5%. The increase occurred at each grade level in both absolute numbers and percentages. The percentage of students who were absent or exempted from writing the tests decreased in 1993 compared to the percentage for 1992. The 1993 overall participation rate of 88.3% is an improvement over the 1992 participation rate of 85.4%.

Results in Relation to Standards for Students Who Wrote the Achievement Tests

What percentage of the students achieved the acceptable standard according to criteria set by Alberta Education?

What percentage of the students achieved the standard of excellence according to criteria set by Alberta Education?

Results are reported in terms of three related but different standards: curriculum standards, assessment standards, and achievement standards.

Curriculum standards are the broad learnings, sequenced into grades, that students are expected to have achieved. They include statements of knowledge, skills, and attitudes against which student achievement is to be judged.

Assessment standards are the scores to be achieved by a student on a specific test or part of a test before the performance of that student is judged to be "acceptable" or "excellent" relative to the curriculum standards.

Alberta Education reports the results for the achievement tests in relation to an *acceptable standard* and a *standard of excellence.*

Achievement standards state what percentage of students at a given grade in school is *expected* to achieve the *acceptable standard* or the *standard of excellence*. These achievement standards apply to school, jurisdiction, and provincial performance.

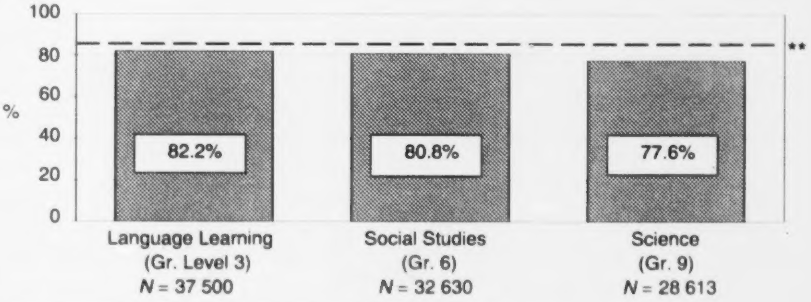
Assessment and achievement standards for the 1993 achievement tests were based on recommendations from a curriculum and test development committee, a test review committee, a public advisory committee, and experienced teachers who applied standard-setting procedures to the tasks under the guidance of the Analytic Services Unit of the Student Evaluation Branch. An outline of the processes followed is provided in Appendix A. Appendix B describes the public review of standards and results.

Guidelines for interpreting the 1993 results are given in Appendix C, and Appendix D provides answers to a number of questions frequently posed by parents. Appendix E describes the development of achievement tests.

In this section, results are reported for the total test. Results for the major components of the tests can be found in sections 2, 3, and 4.

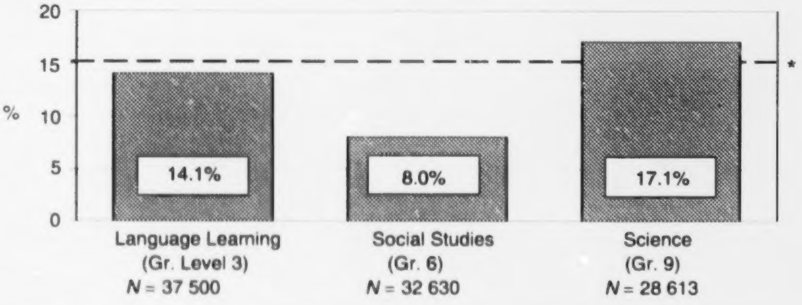
From discussions with educators, test development specialists and curriculum specialists, and based on our experience with measuring student achievement according to the expectations in the *Program of Studies*, we expect 85% of students who write the test to achieve the *acceptable standard* and 15% of students who write the test to achieve the *standard of excellence*.

Figure 1-2
Percentage of Students Achieving Acceptable Standard* on the Total Test
June 1993



*Includes students achieving the standard of excellence
**85% of students who wrote the test were expected to achieve the acceptable standard on the total test.

Figure 1-3
Percentage of Students Achieving Standard of Excellence on the Total Test
June 1993



*15% of students who wrote the test were expected to achieve the standard of excellence on the total test.

Figures 1-2 and 1-3 present the percentage of students who achieved the *acceptable standard* and the *standard of excellence* based on their **total test** scores.

Provincial results for Grade 3 in 1993 are based on test scores achieved by all students who wrote the test, including Francophone and French Immersion students.

Provincial results for grades 6 and 9 in 1993 are based on test scores achieved by students who were in the regular English program. Results for Francophone and French Immersion students were reported directly to participating schools and jurisdictions and are not calculated in provincial results.

General Observations on Results

Of the three grades and subjects tested in 1993, the results in Grade Level 3 Language Learning were closest both to reaching provincial achievement standards and to being judged satisfactory. In Grade Level 3 Language Learning, results based on the total test scores revealed that the percentage of students achieving the *acceptable standard* was slightly lower than expected, and the percentage achieving the *standard of excellence* was marginally lower than expected.

Results for Grade 6 Social Studies were disappointing. The percentages of students achieving standards were lower than expected for both levels.

Grade 9 Science results were mixed. The percentage of students achieving the *acceptable standard* was below expectation. The percentage of students who achieved the *standard of excellence* was higher than expected.

Section 2

Grade Level 3 Language Learning

In 1993 a number of assessments were carried out in Grade Level 3 Language Learning. The achievement test was administered to students province-wide. A Performance-Based Assessment was administered to a sample of Grade Level 3 Language Learning students. As well, a sample of students and teachers participated in a study to examine the relationship among various contexts for learning and achievement. The results from all these assessments follow.

Achievement Test ***General Description***

The Grade Level 3 Language Learning Achievement Test had two parts. *Part A: Writing* was a 65-minute assignment consisting of a picture and a prompt for writing. The assessment was designed to encourage students to use the writing process. *Part B: Reading* was a 50-minute reading test consisting of 40 multiple-choice questions based on nine reading selections.

Statistics for the total test and for the components are based on the results achieved by 37 500 students: 34 607 wrote the regular form and 2 893 participated in the achievement-over-time study, as shown in Table 2-3. This section of the report answers the following questions:

- How many Grade Level 3 students wrote each form of the test or were absent or exempt?
- What percentage of students who wrote the Grade Level 3 Language Learning achievement test achieved the *acceptable standard*?
- What percentage of students who wrote the Grade Level 3 Language Learning achievement test achieved the *standard of excellence*?
- What did Grade Level 3 students know and what could they do in Language Learning?
- What parts of the Language Learning curriculum were difficult for Grade Level 3 students?

Summary of Results

Results show that 82.2% of students who wrote the test achieved the *acceptable standard* and 14.1% achieved the *standard of excellence* on the total test. These results were slightly lower than expected.

Content of the Test

Part A: Writing provided the students with a picture and a brief explanation as a prompt for their writing. Students chose the format (narrative, letter, or diary/journal entries) that would allow them to do their best writing while using their imagination and background experience. This part of the test was scored in three categories: Content and Development, Use of Language, and Conventions. Content and Development was weighted to be worth twice as much as each of the other categories.

Part B: Reading questions were based on reading selections from fiction, non-fiction, poetry, and visual media. These selections were chosen to reflect the varying interests and ability levels of students in Grade Level 3 classrooms. Canadian material was used wherever possible.

Test Blueprint

The test blueprint for *Part A: Writing* shows the reporting categories (scoring guide), a description of the writing assignment, and the emphasis of communication that was assessed.

Table 2-1
Grade Level 3 Language Learning Achievement Test Blueprint
Part A: Writing
June 1993

Reporting Category (Scoring Guide)	Description of Writing Assignment	Standards
Content and Development* Events and/or actions should be plausible and appropriate to the student's purpose for communicating. The student should be able to describe characters and settings that are appropriate within the context or terms of reference established by the student.	The writing assignment follows a writing prompt that is read aloud to the students. The assignment allows the student to select the format that would best fit his/her approach to the prompt.	—meets or exceeds the standard of excellence —approaches the standard of excellence —clearly meets the acceptable standard —approaches the acceptable standard —clearly below the acceptable standard INS — Insufficient
Use of Language The student should be able to use words and expressions effectively in writing.		
Conventions (Using the conventions of language correctly and effectively) The student should be able to communicate clearly in writing by adhering to appropriate spelling, grammar, punctuation, and capitalization.		

* This category is weighted to be worth twice as much as each of the other two.

The test blueprint for *Part B: Reading* shows the reporting categories and genre under which questions are classified.

Table 2-2
Grade Level 3 Language Learning Achievement Test Blueprint
Part B: Reading
June 1993

			Question Distribution by Genre					
			Fiction					
Organizational Framework (Functions)	**General Concept Statement**	**Specific Learner Expectations**	**Stories**	**Poetry**	**Visual Media**	**Non-Fiction**	**Approx. Number of Items**	**Approx. Percent of Test**
Exploring	Concept D: Knowing how ideas and information can be organized and presented contributes to the enhanced understanding and communication of ideas.	D.1, D.2, D.3, D.4, D.5, D.6, D.7	28	32	14, 16	8, 37, 38, 39, 40	9	22.5
Constructing	Concept G: The ability to make associations and connections is essential to the understanding and communication of meaning.	G.1, G.2, G.3, G.5, G.6	1, 19, 20, 27, 31	33, 34			7	17.5
	Concept H: The ability to think analytically is necessary for critical reading, listening, and writing..	H.1, H.3, H.6, H.9, H.10, H.11, H.12	2, 4, 5, 18, 30	35, 36	13, 15	12, 22, 24	12	30
	Concept I: The ability to synthesize is necessary to the understanding and retention of ideas and information.	I.1, I.3, I.5	3, 21, 29		17	6, 7, 9, 10, 11, 23, 25, 26	12	30
		Total Items	14	5	5	16	40	100
		Total Percent	35	12.5	12.5	40	100	100

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Student Participation

In June 1993, principals reported a total population of 42 837 students in Grade Level 3. Table 2-3 presents the number and percentage distribution of students who wrote the Grade Level 3 Language Learning Achievement Test, and who were absent or were exempted. In total, 87.5% of the students reported to be in Grade Level 3 in June 1993 wrote the Grade Level 3 Language Learning Achievement Test.

Table 2-3
Grade Level 3 Language Learning
Student Participation
June 1993

Category	Number of Students		Percentage of Students	
Total Number of Students in Regular Programs*		37 500		87.5
Students Who Wrote the Regular Form**	34 607		80.8	
Students Who Wrote the Achievement-Over-Time Forms:	2 893		6.8	
Form M (Lavender)—Same as the Regular Form	1 013		2.4	
Form L (Red)	940		2.2	
Form K (Blue)	940		2.2	
Students Absent		2 299		5.4
Students Exempted from Writing		3 038		7.1
Categories of Exemption:				
1. Special Needs Students	1 608		3.8	
2. Course Was Not Taught This Term	61		0.1	
3. English as a Second Language Students	604		1.4	
4. Other (as approved by the Superintendent)	765		1.8	
Total Principals' Reported Population Test Day, June 1993:		42 837		100.0
Grade 3 Enrollment: September 30, 1992		42 637		

* Provincial results are based on test scores achieved by all students who wrote the Grade Level 3 Language Learning test, including Francophone students, French Immersion students, and students in other programs.

** Regular Form refers to the unmodified 1993 test. The modified tests are described in Section 8 of this report.

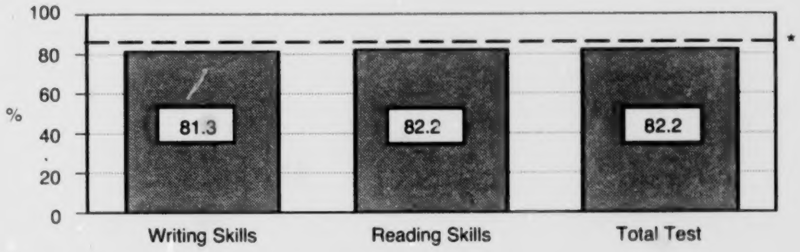
Results in Relation to Standards

Achievement test results are reported in relation to assessment and achievement standards. The **Provincial Assessment Standard** is the lowest score on a test that a student must achieve for his/her performance to be judged "acceptable" and/or "excellent" in relation to curricular expectations. The **Provincial Achievement Standard** refers to the percentage of students writing the test who are expected to achieve the Provincial Assessment Standard.

Figures 2-1 and 2-2 and Table 2-4 show the percentage of students achieving the *acceptable standard* and the *standard of excellence* on the total test and on components of the test. The levels of performance in Grade Level 3 writing and reading were marginally lower than expected; however, significantly more students than expected achieved the *standard of excellence* for reading.

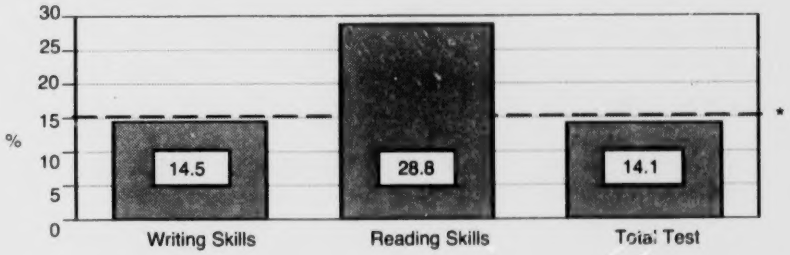
When interpreting these findings, it is important to remember that they are based on the test scores of only a portion (87.5%) of the students reported to have been enrolled in Grade Level 3 in June 1993, i.e., those students in regular programs who wrote the achievement test. These figures tell us nothing about the levels of achievement of students who were absent on the day of writing, or of those students who were exempted from writing.

Figure 2-1
Grade Level 3 Language Learning
Percentage of Students Achieving Acceptable Standard on the Total Test and on Components of the Test
June 1993



*Provincial Achievement Standard—85% of the students in the province who wrote the test are expected to achieve the acceptable standard

Figure 2-2
Grade Level 3 Language Learning
Percentage of Students Achieving Standard of Excellence on the Total Test and on Components of the Test
June 1993



*Provincial Achievement Standard—15% of the students in the province who wrote the test are expected to achieve the standard of excellence

Table 2-4
Grade Level 3 Language Learning
Students Achieving Standards on the Total Test and on Components of the Test
June 1993

Reporting Category	Maximum Possible Score	Provincial Assessment Standard* (Raw Score)	Provincial Achievement Standard** (Percent)	Students Achieving Assessment Standard		
				Expected Number	Actual Number	Actual Percent
Standard of Excellence						
Total Test	100	79	15	5 625	5 271	14.1
Writing Skills Only	20	15	15	5 625	5 432	14.5
Reading Skills Only	40	33	15	5 625	10 788	28.8
Acceptable Standard						
Total Test	100	48	85	31 875	30 827	82.2
Writing Skills Only	20	9	85	31 875	30 499	81.3
Reading Skills Only	40	19	85	31 875	30 809	82.2
Below Acceptable Standard on Both Writing and Reading Skills	N/A	N/A	N/A	N/A	3 251	8.7

*__The Provincial Assessment Standard__ is a score determined by standard-setting procedures and is the lowest score a student must achieve for his/her performance to be judged "acceptable" and/or "excellent" in relation to curricular expectations. See Appendix A.

**__The Provincial Achievement Standard__ refers to the percentage of students expected to achieve the Provincial Assessment Standard.

It should be noted that the actual percentages of students meeting standards on the total test (14.1 and 82.2) are based on the 37 500 students in the regular programs who wrote the test.

If, however, the percentages are based on the total population reported by principals (42 837), the percentages achieving standards on the total test would be:
12.3% meeting the *standard of excellence,*
72.0% meeting the *acceptable standard.*

If the percentages are based on the September 30, 1992, Grade Level 3 enrollment (42 637), the percentages achieve the standards on the total test would be:
12.4% achieving the *standard of excellence,*
72.3% achieving the *acceptable standard.*

It is emphasized that the above percentages, based on total population and enrollment figures, present the lowest estimate of achievement. It is highly likely that some of the students who were absent, exempt, or not accounted for would have achieved standards. The absence of information on these students is nonetheless problematic.

The number of students achieving the *acceptable standard* and the *standard of excellence* for each school was analyzed to determine whether schools were below, meeting, or exceeding provincial achievement standards. Schools classified as meeting provincial achievement standards were those for which the difference between the actual number of students and the expected number of students at or above standards was not statistically significant. Differences are only reported when there is a 5% or smaller probability that a difference of that size could occur by chance.

About one-quarter of schools were significantly below the provincial achievement standard. School administrators and teachers should critically examine language learning achievement test results to determine what they are going to do to improve the level of student achievement. Although this is true for all schools, it is particularly important for those schools performing below the provincial achievement standard.

Table 2-5
Grade Level 3 Language Learning
Percentage Distribution of Schools* Meeting Provincial Achievement Standards on the Total Test
(N = 1 106)
June 1993

	Percentage Distribution of Schools		
Standard	**Significantly Below Provincial Achievement Standard**	**Not Significantly Different From Provincial Achievement Standard**	**Significantly Above Provincial Achievement Standard**
Standard of Excellence	7.1	83.1	9.8
Acceptable Standard	23.1	69.0	7.9

*Schools with fewer than five students are excluded because the statistical significance of the difference between the number achieving the standard and the number expected to achieve the standard when calculated and reported is not educationally meaningful.

Results for Part A: Writing

Results for *Part A: Writing* are most clearly understood in the context of the assignment students responded to and in the context of the scoring guides. The average raw score was 11.4 out of a possible 20, with a standard deviation of 3.1. Complete scoring guides are available from the Student Evaluation Branch, Alberta Education.

Although the papers were scored on a one-marker system, 200 randomly selected papers were re-marked so that a second set of scores was available to confirm scoring consistency. Of the scores awarded on the second reading, 49.3% were identical to the original score on the same scale and 42.3% varied by only one point. The one-marker system produces results that are reasonably reliable for groups of 25 or more students. Achievement test scores, however, are less reliable for individual students.

The results presented in Table 2-6 are best considered in terms of the percentage of students that markers judged to have presented work that clearly met the *acceptable standard* for any reporting category. It is possible to draw conclusions about local program strengths and weaknesses by comparing local results to provincial standards. Statistics presented in Table 2-6 are based on results achieved by 37 500 students.

It should be noted that writing standards in 1993 were higher than those of previous years. In 1993, for example, to be awarded a 3 a student's performance was described as "clearly" meeting expectations, whereas in previous years a score of 3 reflected "satisfactory" performance.

Nonetheless, the results in the three individual reporting categories bear close scrutiny. Of these, in "Content and Development" (students describe characters and settings that are appropriate for the context or terms of reference they have chosen), approximately 1 in 3 or 32.3% were not able to meet the *acceptable standard*. In "Use of Language" (students use words and expressions effectively in their writing), 28.7% or slightly more than 1 in 4 did not meet the *acceptable standard*. The results for the "Conventions" category (students communicate clearly by adhering to appropriate spelling, grammar, punctuation, and capitalization) are similar to the "Content and Development" category. A large number of students, slightly more than 1 in 3 or 35.8%, did not meet the *acceptable standard*. Students did better on the writing component of the achievement test than they did on the performance-based assessment (see Table 2-10).

Table 2-6
Grade Level 3 Language Learning
Percentage Distribution of Scores by Reporting Category
Part A: Writing
June 1993

	Reporting Category		
Standards	**Content and Development**	**Use of Language**	**Conventions**
Meets or Exceeds the Standard of Excellence	2.9	3.3	4.4
Approaches the Standard of Excellence	14.7	15.4	17.7
Clearly Meets the Acceptable Standard	50.1	52.6	42.0
Approaches the Acceptable Standard	27.3	24.7	29.1
Clearly Below the Acceptable Standard	4.8	3.8	6.5
INS (Insufficient)	0.2	0.2	0.2

Results for Part B: Reading

Reporting Categories

Table 2-7 shows the total marks possible and the provincial raw score results for the reporting categories of the reading portion of the Grade Level 3 Language Learning Achievement Test.

It is important to stress that the averages on the various reporting categories cannot be directly compared with one another. Rather, the results shown in Table 2-7 can best be used in conjunction with parallel tables in the jurisdiction and school reports. Variations in patterns of students' responses to questions can help to indicate strengths and weaknesses in local educational programs. Statistics presented in this table are based on results achieved by 35 620 students (those who wrote the regular form and those who wrote Form M).

Table 2-7
Grade Level 3 Language Learning
Raw Score Results by Reporting Category
Part B: Reading
June 1993

Reporting Category	Number of Questions	Raw Score Average	Raw Score Standard Deviation
Total	40	26.7	8.0
Organization of Information	9	6.0	2.2
Associating/Connecting	7	4.3	1.8
Analyzing	12	8.4	2.5
Synthesizing	12	8.0	2.7
Stories	14	9.3	3.2
Poetry	5	3.1	1.4
Visual Media	5	3.8	1.2
Non-Fiction	16	10.5	3.5

Percentage of Students Choosing Each Alternative

Table 2-8 shows the percentage of students who chose each alternative (A, B, C, and D) for each multiple-choice question. The correct response for each question is identified with an asterisk and the curriculum standard each question measures is specified. The questions are grouped by reporting category.

The results shown in Table 2-8 can best be used in conjunction with similar tables in the jurisdiction and school reports. Variations in patterns of students' responses to questions can help to indicate strengths and weaknesses in local education programs.

Statistics presented in Table 2-8 are based on results achieved by 35 620 students (those who wrote the regular form and those who wrote Form M).

Table 2-8
Grade Level 3 Language Learning
*Results for Individual Multiple-Choice Questions***
June 1993

Item	Distribution of Responses (%)				Category	Curriculum Standard
	A	B	C	D		
8	**57.2***	4.1	6.8	30.8	IO	use headings to assist reading
14	12.8	4.9	11.9	**69.6***	IO	use visual cues in conjunction with print to make sense of reading
16	9.5	11.6	12.5	**65.4***	IO	locate author using experience with book elements
28	12.0	11.5	**64.4***	10.9	IO	locate pertinent details about setting

Continued

* correct answer.

**The sum of the percentages for each question may be less than 100% because the No Response category is not included.

Category Legend: IO—Identifying the Organization of Information AC—Associating/Connecting A—Analyzing SI—Synthesizing Ideas

Table 2-8 (continued)

Item	Distribution of Responses (%)				Category	Curriculum Standard
	A	B	C	D		
32	12.8	3.9	13.7	**68.5***	IO	attend to typographical features to assist reading
37	7.2	1.8	16.7	**72.6***	IO	attend to text features to assist reading
38	**73.9***	7.4	8.6	8.3	IO	use visual cues in conjunction with print to make sense of reading
39	8.2	**72.7***	11.8	5.6	IO	use headings to assist reading
40	12.1	**54.2***	12.2	19.7	IO	use visual cues in conjunction with print to make sense of reading
1	17.4	34.5	7.6	**40.0***	AC	identify the meaning of a word from its context
19	**62.0***	10.4	10.8	16.0	AC	decide the most likely meaning of a word using context clues
20	20.3	13.2	14.2	**51.6***	AC	relate pertinent details describing character motivation
27	8.2	**77.9***	**5.3**	7.4	AC	decide the most likely meaning of an expression using context clues
31	5.0	6.3	**77.5***	9.3	AC	identify connotations of words beyond their literal meaning
33	**73.5***	4.0	16.1	4.8	AC	identify connotation of a phrase beyond its literal meaning
34	26.9	12.2	**51.3***	8.0	AC	decide the most likely meaning of a word using context clues
2	13.7	**79.0***	4.0	3.1	A	determine explicit relationships between characters
4	**75.1***	6.1	12.5	5.8	A	recognize the explicit relationship between characters and events
5	**63.8***	7.9	10.1	17.6	A	recognize the explicit relationship between characters and events
12	26.6	4.2	15.9	**52.5***	A	determine the relationship between title and passage
13	**76.7***	16.0	3.1	3.8	A	infer character motivation using pertinent details
15	3.2	5.1	**87.6***	3.4	A	infer character's feelings using pertinent details
18	10.5	3.6	**82.1***	3.3	A	recognize the explicit relationship between characters and events
22	17.0	9.5	4.0	**68.6***	A	determine the relationship among details in the passage
24	9.2	15.0	**58.7***	15.7	A	recognize key details in the passage
30	5.5	10.4	5.2	**77.2***	A	infer implicit relationships between characters and events using pertinent details

*correct answer.

Continued

Category Legend: IO—Identifying the Organization of Information AC—Associating/Connecting A—Analyzing SI—Synthesizing Ideas

Table 2-8 (continued)

Item	Distribution of Responses (%)				Category	Curriculum Standard
	A	B	C	D		
35	11.9	**77.0***	4.2	5.3	A	determine poet's attitude towards subject
36	46.7	7.5	**37.2***	6.5	A	infer poet's purpose for writing a poem
3	2.8	8.0	**86.1***	2.7	SI	judge character motivation using pertinent details
6	19.0	14.5	**54.0***	12.0	SI	make a judgement about key details in the passage
7	6.1	**73.9***	9.6	9.8	SI	draw a conclusion by relating what she/he knows to new information in the passage
9	5.3	9.1	**70.8***	14.4	SI	make a generalization about characters using pertinent details
10	**81.1***	4.8	5.9	7.6	SI	make a generalization about characters using pertinent details
11	27.0	4.3	5.8	**62.3***	SI	judge character motivation using pertinent details
17	**81.8***	4.0	2.2	11.0	SI	draw a conclusion by relating what she/he knows to new information in the passage
21	15.6	14.0	**54.1***	15.3	SI	draw a conclusion by relating what she/he knows to new information in the passage
23	**49.1***	7.4	36.5	5.9	SI	draw a conclusion by relating what she/he knows to new information in the passage
25	9.6	**78.0***	4.9	6.2	SI	draw a conclusion by using information from the passage
26	14.9	**69.4***	4.5	9.5	SI	make a generalization using given information
29	26.5	**40.4***	10.6	20.7	SI	draw a conclusion by relating what she/he knows to new information in the passage

*correct answer.

Category Legend: IO—Identifying the Organization of Information AC—Associating/Connecting A—Analyzing SI—Synthesizing Ideas

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Examiner's Observations

Writing Component

The overall quality of the writing in Language Learning in 1993 is better than that done in 1989. Teachers who marked the tests were very pleased with most of the papers. They observed specifically that students are strong in the following areas: planning, story structure, and content and development. The markers agreed that students, for the most part, showed genuine confidence in their writing and hence were willing to take the risks that resulted in a better product.

A small number of students wrote superior papers. These were lively, imaginative, and technically very well written. The quality of these papers far exceeded the expectations for students in a Grade 3 classroom.

Reading Component

The following is a discussion of specific areas of strength and weakness for students in Grade 3 classrooms. Sample questions from the test are provided to highlight these areas for students achieving the *acceptable standard* and for those achieving the *standard of excellence*. For each sample question, the filled-in circle shows the keyed answer. The percentage of students choosing each alternative is also provided.

Acceptable Standard

For **question 17,** students had to determine the lesson or moral implied in the reading passage. Those students who achieved the *acceptable standard* were able to do this quite readily.

In **question 1,** students achieving the *acceptable standard* but not the *standard of excellence* had difficulty inferring the meaning of a word from its context in a sentence.

The strengths of students who achieved the *acceptable standard* include an ability to

- determine the lesson or moral implied in the reading selection (see question 17)
- identify directly stated details of setting and character motivation
- infer character motivation
- use visual cues in conjunction with print to make sense of their reading

However, many of these students did not do as well as expected in

- recognizing the meaning of words and phrases from the context of the material (see question 1)
- making judgements about the author's purpose for writing
- clearly understanding selections that were not the usual story form: poems, recipes, and experiments

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17. What lesson does this story teach us?
81.8 ● Be satisfied with the way you are.
4.0 ○ Be sure to look before you leap.
2.2 ○ The biggest dog was once a puppy.
11.0 ○ Donkeys and dogs can be friends.

---

1. What is the meaning of the underlined word seldom?
17.4 ○ Many times
34.5 ○ Often
7.6 ○ Never
40.0 ● Hardly ever

26. People would MOST LIKELY make their own crystal mountains because

14.9 ○ it is fun to watch them in the dark
69.4 ● crystals are pretty and interesting
4.5 ○ it is good to eat them
9.5 ○ crystals are quick and easy to grow

7. The sticks are placed in the mixture when it is almost frozen so that the

6.1 ○ sticks will not break
73.9 ● sticks will stay in place
9.6 ○ mixture freezes better
9.8 ○ mixture will not separate

Standard of Excellence

Students achieving the *standard of excellence* had no difficulty with the following sample questions that accompanied experiments, a written form which students achieving the *acceptable standard* (but not the *standard of excellence*) found more difficult.

Question 26 required students to synthesize information given in the experiment to make a judgement about what people might do.

Question 7 required students to relate what they know to new information presented in the passage and to draw conclusions.

Clearly, students who achieved the standard of excellence (28.8%) had very few difficulties with this assessment. These students could

- synthesize information from the selection to make judgements/ draw conclusions (see question 26)
- recognize the meanings of words and phrases from the context of the material
- make judgements about the author's purpose for writing
- make judgements about character motivation
- understand clearly the selections that were not the usual story form: poems, recipes, and experiments

Issues

During the 1993 marking session, teachers were asked to comment on both parts of the test. Teachers were mostly in favour of the two changes that were made in the administration of the Language Learning Test: the assessment was written over two days, the writing component on the first day and the reading component on the second day, and students were allowed to discuss the writing prompt in groups of two to four. Teachers thought that these changes were positive because they helped students do their best work.

One area of concern emerged from the multiple-choice reading component. Questions from the catalogue card selection caused some misgivings for teachers in schools with an automated library system. Teachers thought that those students familiar with an automated system would be disadvantaged compared to those who have a conventional system in their school. In fact, analysis of the four questions pertaining to the catalogue card indicates that there was no advantage to students familiar with more conventional systems, and on the whole, students in the province did very well on those four questions (see questions 37 to 40).

Performance-Based Assessment

As part of Alberta Education's broadened assessment initiatives, a sample of 594 Grade 3 students from across the province participated in the Language Learning Performance-Based Assessment (PBA). This activity-based assessment using actual books was developed by Grade 3 teachers to assess a broader range of reading and writing skills and to support classroom instruction. Students remained together as a class in their regular classroom setting, with both their teacher and the assessment administrator present. By engaging students in hands-on book reading followed by writing, we hoped to obtain valuable information about how well students explore, construct, and communicate meaning.

Reading Component

General Description

The reading component required students to choose a book from a given selection. A range of titles was provided, all considered by Grade 3 teachers to be appropriate for their students. Several titles were included for students who needed reading material at a slightly lower level. After reading, students responded to a series of open-ended questions. Students were given as much time as was needed to complete the assessment. Copies of the student response sheets and scoring guides are available from Student Evaluation Branch, Alberta Education. Provincial results from the reading component are shown in Table 2-9.

Table 2-9
Grade Level 3 Language Learning Performance-Based Assessment
Percentage Distribution of Scores by Reporting Category
Reading Component
June 1993

Score *	Reporting Category					
	Predictions	Story Structure	Retelling Main Events	Characters	Personal Connections	Opinions
5	1.3	0.5	5.6	2.0	2.0	2.4
4	20.0	10.9	10.8	15.3	9.1	14.1
3	44.1	44.3	34.5	37.9	37.0	70.4
2	31.8	33.8	37.2	26.6	30.6	7.6
1	2.7	10.4	10.8	14.3	11.1	3.2
0	0.0	0.0	1.2	3.7	10.1	2.4

*A score of 3 or above indicates that students have met or exceeded the acceptable standard. Scores within the shaded area (2 or below) indicate that students have not met the acceptable standard.

Examiner's Observations

The assessment was divided into six scoring categories (Predictions, Story Structure, Main Events, Characters, Personal Connections, and Opinions) and the way in which students met the scoring criteria varied depending on the category.

In all, three out of four of students achieved the *acceptable standard* for Grade Level 3. Those students were able to express predictions related to the book cover, demonstrate an understanding of story events and sequence, and identify most of the story's main events. They were also able to describe the cause of a story character's behaviour, make a personal connection to what they read, and express and loosely support an opinion about the book. Students who are achieving beyond Grade Level 3 expectations were able to make predictions based on a story problem or theme, describe in detail all key features of a given story, and express main events of a story in a clear and concise manner. They were also able to describe internal and external character motivation, make personal connections related to the story problem or theme, and supply an opinion about the story along with justification.

One quarter of the students did not achieve the *acceptable standard* for Grade Level 3. Those students had difficulty making predictions related to the book. They could retell only some story events and often included supporting details in place of main events. They were able to describe what story characters did without referring to the cause of the behaviours, identify but not explain a personal connection to the story, and supply an opinion about the book without a reason.

In the category Opinions, a high percentage of students, 87%, were able to express and support opinions at an *acceptable standard*. The category with the next highest percentage of students achieving an *acceptable standard* was Predictions, where two-thirds of the students were able to make plausible predictions. Students had the most difficulty in the Personal Connections category, where they were required to connect what they read to their personal experiences. Only 48% of them achieved an *acceptable standard*. Responses in the category Retelling Main Events were also weak; only half the students achieved an *acceptable standard*.

These results seem to indicate that students achieve at different levels when responding to what they have read, depending on the nature of interaction with the text demanded of the students. The two categories that had the highest percentages of students achieving an *acceptable standard*, Opinions and Predictions, are more reader-based. That is, success depends more on the knowledge and background the reader brings to the task and is not highly constrained by the text.

The Story Structure and Characters categories each had 55% of students achieving an *acceptable standard*. In order to answer these questions at an acceptable level, students are required to draw on their knowledge of the text itself and then organize the information. It seems that students find questions that depend on text-based knowledge more difficult than those that are primarily reader-based.

The categories that elicited the poorest levels of achievement, Retelling Main Events and Personal Connections, are those that require the students to integrate both reader-based and text-based knowledge in order to make inferences and draw conclusions.

It seems that students do draw on their prior knowledge and background experience when they read. However, they have more trouble focusing on the content of the text they are reading. They have the most difficulty making meaning by integrating information from their personal knowledge and the text. The results of the performance-based assessment suggest that helping students use their own experience as well as their knowledge of text features will help improve their reading comprehension.

Writing Component

General Description

The writing component required students to write their own story, letter, or series of diary/journal entries using an idea that they might have generated while reading the book during the reading component. Students brainstormed ideas for writing in small groups with others who had read the same book. They were instructed not to retell the book they had read, simply to use an event, setting, character, or other story features as a springboard for their own writing.

The writing component was scored using the same reporting categories and criteria as *Part A: Writing* of the Achievement Test. Provincial Results are shown in Table 2-10.

Table 2-10
Grade Level 3 Language Learning Performance-Based Assessment
Percentage Distribution of Scores by Reporting Category
Writing Component
June 1993

Standards	Reporting Category		
	Content and Development	Use of Language	Conventions
Meets or Exceeds the Standard of Excellence	3.7	3.9	4.7
Approaches the Standard of Excellence	13.9	13.1	15.1
Clearly Meets the Acceptable Standard	44.6	43.4	39.0
Approaches the Acceptable Standard	28.8	30.3	29.8
Clearly Below the Acceptable Standard	8.1	8.5	10.5
INS (Insufficient)	0.8	0.8	0.8

Examiner's Observations

Students achieving the *acceptable standard* but not the *standard of excellence* for Grade Level 3 produced writing that followed a format with an identifiable beginning, events, and conclusion. Events and details were related and generally flowed from one to another. Endings were fairly predictable. Some specific vocabulary was used, although most words were general in nature. Familiar words were spelled correctly and unfamiliar words were spelled phonetically. End punctuation and capitalization were usually correct.

Students achieving the *standard of excellence* for Grade Level 3 produced writing that contained a direct relationship among events, providing for a smooth flow from one action to the next. Character motivation was consistent throughout, and most events contributed to the main character's achievement of his/her goal. These writers showed an awareness of audience by providing details to explain why events occurred and by providing information about the characters' emotional responses to the events. Events were brought to an appropriate conclusion. The writer's voice was often heard through the writing, captivating and holding the reader's interest. The lengths and types of sentences varied. Specific adjectives and colourful expressions were found throughout the writing. End punctuation and capitalization were correct. Most words, familiar and unfamiliar, were spelled conventionally.

Students below the *acceptable standard* for Grade Level 3 produced writing that contained few events or actions. Beginnings were confusing, and subsequent events, did not appear to be related. Few details were included to explain the events, and endings were unconnected or non-existent. Words were general and did not provide sufficient information to the reader. There was little evidence that the writer understood the correct use of end punctuation and capitalization. Words were difficult to discern and were generally spelled phonetically.

Relationship between the Performance-Based Assessment and the Achievement Test

Correlations among all four components of the Grade Level 3 Language Learning assessment (multiple-choice reading component of the achievement test, writing component of the achievement test, PBA reading component, and PBA writing component) were calculated. Positive relationships, with correlation coefficients ranging from .48 to .55, were found to exist among all four components. The findings of this study are confirmed by other research studies where correlations average about .45.

This finding is encouraging as it indicates that there is a positive relationship among the four types of Language Learning assessments. This would be expected if we are, in fact, assessing outcomes related to the same subject area. The fact that the correlation coefficients fall within a mid-range is also encouraging because it means that the performance-based assessment does not exactly duplicate information about student achievement provided by the machine-scorable component. Somewhat different aspects of achievement are being assessed. We are learning something different about what students know and can do from each of the two types of assessment.

Performance-based assessment allows us to see more closely the kinds of knowledge students use when they are reading in situations similar to those encountered in the classroom on a daily basis. In responding to open-ended questions, students are able to select from a variety of strategies, depending on their own strengths as well as on the demands of the task itself. The examination and analysis of those responses and the strategies used give us more of a profile of the processes students use while reading. That information can then be used to outline more specifically students' strengths and weaknesses in order to design programs that better meet their needs.

Students did not do as well on the writing component of the performance-based assessment as they did on the writing component of the achievement test. Fewer students achieved an *acceptable standard* on the performance-based assessment in all three reporting categories. In Use of Language, fully 10% fewer students (60.4% as compared to 71.3%) met the *acceptable standard* on the performance-based assessment.

Students had more difficulty with a writing task that was connected to a reading experience than they did on a task that was more open in nature. Again, it seems that the more students are required to integrate a variety of strategies in order to complete a task, the more difficulty they have. The writing component of the performance-based assessment required students not only to comprehend the story they read, but to integrate that with their own ideas to create an original story. In contrast, the writing component of the achievement test required students to look at a visual and then expand on their own ideas. Although reading and writing are often integrated in Grade Level 3 classrooms, students have not yet mastered the application of a variety of strategies associated with reading and writing to a single task.

These findings support the idea that a combination of assessment strategies (multiple-choice, performance-based assessments, and ongoing classroom-based assessments) are needed to provide a complete picture of student achievement in Language Learning.

Context for Learning
General Description

In June 1993, a random selection of 1 961 Language Learning students in Grade 3 participated in a study that surveyed students' attitudes on various language learning issues. The results from the survey are presented in Table 2-11.

Table 2-11
Grade Level 3 Language Learning
Survey on Attitudes Toward Language Learning
Percentage Distribution of Student Responses
June 1993

Statement	Yes	No	Not Sure	No Response
1. I think reading is an important skill.	95.5	1.3	2.9	0.4
2. Everyone needs to know how to read.	83.6	7.4	8.5	0.5
3. After I've read something by myself, I like to:				
a. Draw a picture	46.0	35.5	12.6	5.9
b. Tell someone about it	47.0	33.1	12.7	7.1
c. Find another book like it	51.5	28.9	12.9	6.8
d. Write something about it	35.0	43.3	13.1	8.6

Continued

Table 2-11 (continued)

Statement	Yes	No	Not Sure	No Response
4. I am a good reader.	74.2	5.6	18.8	1.4
5. I am a good writer.	68.1	8.5	21.8	1.6
6. I like writing:				
a. Reports	46.4	34.5	13.0	6.1
b. Journals/diaries	47.3	32.7	13.1	6.9
c. Letters	65.9	17.2	11.2	5.7
d. Stories	80.0	8.3	7.5	4.2
e. Poems	52.9	25.5	15.7	5.9

Statement	Often	Sometimes	Never	No Response
7. I keep my writing in a writing folder.	42.3	40.1	14.5	3.0
8. Before I write, I like to:				
a. Talk to my classmates	27.6	44.5	22.2	5.4
b. Draw a web	22.3	33.0	40.4	4.3
c. Make a chart	21.4	37.2	35.8	5.6
d. Listen to my teacher	64.5	23.3	7.8	4.4
e. Imagine	62.6	24.9	9.4	3.1
9. I like to:				
a. Talk about books I have read	29.2	44.7	21.3	4.8
b. Listen to my teacher read stories	74.4	18.5	4.0	3.1
c. Read during my spare time	47.6	40.0	8.3	4.0
d. Write during my spare time	25.9	48.7	20.9	4.6
10. I choose my books based on:				
a. Author	24.2	38.5	32.7	4.6
b. Topic (for example, mysteries)	56.8	28.8	10.4	4.1
c. The pictures	27.6	38.0	29.3	5.1
d. How hard the words are	34.4	35.3	25.9	4.5
11. I use the school library to choose:				
a. Stories for free reading	59.6	28.7	8.1	3.7
b. Information books (for example, animal books, books on amazing facts, or encyclopedias)	39.5	41.9	13.4	5.3
c. Books to learn how to do things	36.6	46.7	12.1	4.5

Continued

Table 2-11 (continued)

Statement			Often	Sometimes	Never	No Response
12.	This year, I read or used:					
	a.	Magazines	27.0	39.8	27.8	5.5
	b.	Newspapers	19.3	32.5	42.8	5.4
	c.	Dictionaries	37.9	43.1	14.1	4.8
	d.	Encyclopedias	23.0	39.6	32.3	5.0
	e.	Atlas/Globe	27.3	41.8	25.8	5.1
	f.	Poetry	36.5	39.6	18.5	5.5
	g.	Fiction books	59.9	26.7	8.7	4.7
	h.	Information books (non-fiction)	42.6	41.3	10.4	5.8
	i.	Comics	53.1	26.6	16.0	4.3

Student Attitude Questionnaire

Results indicate that of the students surveyed, 95.5% believe that reading is an important skill. Analysis of the student questionnaires indicate that the majority of students (85.6%) often or sometimes choose their reading material by topic and the most often read materials are fiction books, comics, and information books. Students use the school library mainly for choosing leisure reading materials. Students' favoured types of writing are stories, letters, and poems; 74.4% of the surveyed students like to listen to their teacher read stories.

The students surveyed tended to underestimate their abilities in writing and reading; 68.1% of these students thought they were good writers, and 74.2% thought that they were good readers. In actual fact, on the achievement test 81.3% and 82.2% of students achieved the *acceptable standard* in writing and reading respectively.

Relationship between Student Attitudes and the Achievement Test

We were able to compare the results of 940 of the 1 961 students who participated in the attitude survey with their Grade Level 3 Language Learning Achievement Test results. Of the 152 students who achieved the *standard of excellence* on the total achievement test, 90.1% believe that they are good readers. This is sharply contrasted by students who performed below the *acceptable standard* (*n*=132), where only 44.9% believed themselves to be good readers.

Students achieving the *standard of excellence* on the total test tend to be capable and enthusiastic readers. It was not surprising to find that 68.5% of those students achieving the *standard of excellence* read for enjoyment during their leisure time, whereas the same is true for only 46.2% of students who only achieved the *acceptable standard* and 40.8% of those performing below the *acceptable standard*.

It is interesting to note that when students who are below the *acceptable standard* read in their spare time, they do so in order to learn something specific more often (40.2%) than do students who achieved the *acceptable standard* (38.8%) or who achieved the *standard of excellence* (30.2%). This reinforces the belief held by many teachers that reading, especially for weaker students, must have a real purpose in order for students to actively engage it.

In preparation for writing, only one in four students surveyed like to talk to classmates, draw a web, or make a chart, whereas two out of three students in this group like to listen to their teacher and imagine. These activities are quite different in nature; the former three require the student to be actively involved with others or alone when producing a product, whereas the latter two are activities that allow students to be more passive. This suggests that students are more comfortable in situations where they are required to take less personal risk.

Teacher Questionnaire

In July 1993, 280 teachers from across the province, including 150 teachers who were marking the writing component of the Grade Level 3 Achievement Test, participated in a study that surveyed the instructional strategies and learning environments they provided in the classroom. The results from the survey are presented in Table 2-12. The vast majority of the teachers surveyed provide time for silent reading at least once per week. Teachers report that classroom environments are "print rich" with magazines, newspapers, both fiction and non-fiction books, as well as reference materials. Students who achieved the *acceptable standard* tend to have access to these resources slightly more often than do students who have not yet achieved the *acceptable standard*. It is interesting to note that all teachers surveyed set aside time to read to their students.

Table 2-12
Grade Level 3 Language Learning
Teacher Survey on Instructional Practices and Learning Environments
Percentage Distribution of Teacher Responses
June 1993

Statement	Never	Less Than Once a Week	Once a Week	Several Times a Week	Every Day	No Response
1. Did your students write in L.L.?	0.0	1.8	7.5	46.1	42.5	2.1
2. Did your students write in a journal for L.L.?	4.3	12.1	27.1	40.7	14.3	1.4
3. Did your students use the school Library?	0.4	0.7	61.8	32.1	3.9	1.1
4. Did you set aside time to read to your students?	0.0	2.5	3.9	36.4	56.4	0.7
5. Did your students do silent reading?	0.0	0.7	3.9	25.0	70.0	0.4
Statement	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**	**No Response**
6. Did your students have a choice about what they wrote?	0.0	0.7	21.4	59.6	17.5	0.7
7. Did your students do prewriting activities before they wrote?	0.0	3.2	21.8	43.9	30.4	0.7
8. Did your students use a computer at school to do the following?						
a. All of their writing (from draft to final copy)	63.6	15.7	10.7	1.8	0.7	7.5
b. Some of their writing	46.8	23.2	21.1	6.1	0.4	2.5
9. Did your students write a number of drafts before handing in the final copy?	4.6	23.9	33.6	22.5	11.4	3.9
10. Did you have conferences with your students about their writing?	1.1	13.9	36.8	34.6	9.6	3.9
11. Did you use the following instructional strategies with your students?						
a. Reading workshop	20.7	13.2	22.9	23.9	7.5	11.8
b. Paired Reading	2.9	11.8	28.2	45.4	8.6	3.2
c. Learning Centres	12.9	24.3	29.3	23.6	4.6	5.4
d. Drama	4.6	39.3	37.1	13.6	1.1	4.3
e. Group Work	0.7	3.2	23.6	57.9	12.5	2.1
f. Cooperative Learning	4.3	11.4	22.9	43.2	15.0	3.2

Continued

Table 2-12 (continued)

Statement	No	Yes	No Response
12. Did you use the following types of assessments with your students?			
a. Multiple-choice test	24.3	70.0	5.7
b. Short-answer test	11.1	82.9	6.1
c. True-false test	49.3	43.6	7.1
d. Interpretation of charts, diagrams, pictures, graphs, and maps.	1.8	91.8	6.4
e. Creation of a diagram, picture, mural, collage, or model to show understanding	3.9	90.0	6.1
f. Oral presentation	3.9	90.7	5.4
g. Arrangement of events in order	6.8	87.5	5.7
h. Classification of pictures/words/phrases	8.9	84.3	6.8
13. Were the following materials available in the classroom for the students?			
a. Magazines	9.6	84.6	5.7
b. Newspapers	50.4	42.1	7.5
c. Dictionaries	0.7	94.3	5.0
d. Encyclopedias	41.4	50.7	7.9
e. Atlas/Globe	7.1	87.9	5.0
f. Poetry	3.2	91.1	5.7
g. Fiction books	0.0	95.0	5.0
h. Non-fiction books	1.1	93.6	5.4
14. Are the following reading series available in your school for you to use?			
a. Early Bird Collection	67.9	6.1	26.1
b. Impressions	18.2	70.0	11.8
c. Journeys	45.4	32.5	22.1
d. Networks	35.7	43.6	20.7
e. Unicorn	59.3	11.8	28.9
f. Waves	66.8	3.6	29.6
g. Reflections	65.0	5.0	30.0
15. Did your students, as a class, experience the following?			
a. Live theater			
b. Concert	21.4	71.8	6.8
c. Symphony/Opera	24.3	67.1	8.6
d. Movie	62.1	26.8	11.1
e. Museum/Art Gallery	9.6	84.6	5.7
	34.6	56.8	8.6
16. Did your students have a portfolio or writing folder for samples of their writing?	8.9	85.4	5.7

Slightly more than one in four teachers surveyed said that their students use the computer for some of their writing at least once per week. It is an encouraging sign that the technology is becoming more readily accessible in the lower elementary grades; as it becomes more available, we should see an emerging trend of younger students actively using the technology for more of their work.

Of the teachers surveyed, one in four did not respond to the question about the reading resources in their schools. They appear to be uncertain about the availability of the specific resources mentioned in this survey.

Relationship between Learning Environment and the Achievement Test

Achievement test results of 509 students were matched with teachers who participated in the survey of instructional practices and learning environments. Students were split into three groups: students achieving the *standard of excellence*, students achieving the *acceptable standard* but not the *standard of excellence*, and students not yet achieving the *acceptable standard*. Differences in reported teaching behaviours matched to these students were examined. All of the teachers in this matched study reported that their students used their school library at least once per week. All teachers provided field trip experiences outside the regular classroom milieu: 92.8% of teachers of students who achieved the *standard of excellence* provided an opportunity for viewing live theatre, and 100% of these teachers took their students to art galleries and museums.

The study showed that 25.5% of teachers of students achieving the *standard of excellence* always have their students write multiple drafts of compositions, compared to 18.0% of teachers of students achieving the *acceptable standard* and 15.3% of teachers of students who were below the *acceptable standard*.

Furthermore, 7.2% of the teachers of students who achieved the *standard of excellence* always conference with their students about their writing, whereas 6.8% of teachers of students achieving the *acceptable standard* and only 4.7% of those teachers of students who were below the *acceptable standard* follow the same practice.

Section 3

Grade 6 Social Studies

In 1993 a number of assessments were carried out in Grade 6 Social Studies. The achievement test was administered to students province-wide. Student self-reports and teacher ratings were collected in a sample of classrooms as a means of gathering information about process skills. As well, a sample of Grade 6 Social Studies students and teachers completed questionnaires designed to examine the relationships among various contexts for learning and achievement. The results from all these assessments follow.

Achievement Test ***General Description***

The Grade 6 Social Studies Achievement Test had two parts. Part A consisted of 50 multiple-choice questions and Part B was a writing assignment. Part A was worth 70% and Part B was worth 30% of the total test mark. Students had 60 minutes to complete each part of the test.

Statistics for the total test and for the components are based on the results achieved by 32 630 students: 29 802 wrote the regular form and 2 828 participated in the achievement-over-time study, as shown in Table 3-3. This section of the report provides answers to the following questions:

- How many Grade 6 students wrote each form of the test or were absent or exempt?
- What percentage of students who wrote the Grade 6 Social Studies Achievement Test achieved the *acceptable standard*?
- What percentage of students who wrote the Grade 6 Social Studies Achievement Test achieved the *standard of excellence* ?
- What did Grade 6 students know and what could they do in Social Studies?
- What parts of the Social Studies curriculum were difficult for Grade 6 students?

Summary of Results

Results show that 80.8% of the students who wrote the test achieved the *acceptable standard* and 8.0% achieved the *standard of excellence*. These results were lower than expected.

Content of the Test

Of the 50 multiple-choice questions in Part A, 19 questions on Topic A, which dealt with *Local Government*, 15 were on Topic B, which dealt with *Greece: An Ancient Civilization*, and 16 were on Topic C, which dealt with *China: A Pacific Rim Nation*.

The Part B writing assignment asked students to write one to three paragraphs on the issue "Should governments help people meet their needs?"

The test assessed students' knowledge of facts, concepts, and generalizations, as well as their application of process skills such as using information to draw conclusions.

Test Blueprint

The test blueprint for *Part A: Multiple Choice* shows the distribution of questions according to the curricular content area (topic) being assessed and according to the knowledge and process skills required to answer the question.

Table 3-1
Grade 6 Social Studies Achievement Test Blueprint
Part A: Multiple Choice
June 1993

		Question Distribution			
	Knowledge/Skills	**Topic A Local Government**	**Topic B Greece: An Ancient Civilization**	**Topic C China: A Pacific Rim Nation**	**Proportion of Total Score**
Knowledge	Understands generalizations, concepts, related facts and content	1, 2, 3, 18 22, 36, 37, 39, 49	4, 9, 10, 11, 17, 20, 21, 25, 27	8, 16, 30, 31, 32, 33, 34, 35	**36%**
Process Skills	Locating, organizing, interpreting information*	40, 42, 46, 47, 48	7, 26, 44	13, 14, 28, 29, 43, 45	**34%**
	Analyzing, synthesizing, evaluating	19, 23, 38, 41, 50	5, 6, 24	12, 15	
	Proportion of Total Score	**27%**	**21%**	**22%**	**70%**

* This includes the section in the Program of Studies entitled "Geography/Mapping" under Process Skills.
Three questions were deleted because the choices were ambiguously worded (22, 33, 45).

The blueprint for *Part B: Written Response* shows the reporting categories and the proportion of score.

Table 3-2
Grade 6 Social Studies
Achievement Test Blueprint
Part B: Written Response
June 1993

Description of Writing Activity	Reporting Category	Proportion of Score
Express an opinion/position using examples for support.	1. **State and Support an Opinion/Position** Students are expected to persuasively give their opinion/position and use relevant examples to support it.	20%
	2. **Quality of Language and Expression** Students are expected to express their ideas in an organized manner with clear, effective language, using correct conventions of spelling, punctuation, and grammar.	10%
	TOTAL	30%

Student Participation

In June 1993, principals reported a total population of 39 097 students in Grade 6. Table 3-3 presents the number and percentage distribution of students who wrote the Grade 6 Social Studies Achievement Test, who were absent, or who were exempted. In total, 89.7% of the students reported to be in Grade 6 in June 1993 wrote the Grade 6 Social Studies Achievement Test. Results for Francophone and French Immersion students are reported directly to participating schools and jurisdictions and are not included in the calculation of the provincial results presented in this section of the report.

Table 3-3
Grade 6 Social Studies
Student Participation
June 1993

Category	Number of Students	Percentage of Students
Total Number of Students in Regular Programs*	32 630	83.5
Students Who Wrote the Regular Form	29 802	76.2
Students Who Wrote the Achievement-Over-Time Forms:	2 828	7.2
Form F (Golden rod)—Same as the Regular Form	961	2.5
Form E (Cherry)	932	2.4
Form D (Grey)	935	2.4
Other Students Who Wrote:	2 432	6.2
Francophone—Taught in French, Wrote in French	0	0.0
Francophone—Taught in French, Wrote in English	176	0.5
French Immersion—Taught in French, Wrote in English	24	0.1
French Immersion—Taught in French, Wrote in French	2 232	5.7
Students Absent	1 709	3.2
Students Exempted from Writing	2 326	14.7
Categories of Exemption:		
1. Special Needs Students	1 072	2.7
2. Subject Was Not Taught This Term	508	1.3
3. Students in English as a Second Language	407	1.0
4. Language of Instruction Was Not English	63	0.2
5. Other (as approved by the Superintendent)	276	0.7
Total Principals' Reported Population Test Day, June 1993:	39 097	100.0
Grade 6 Enrollment: September 30, 1992	38 484	

* Provincial results are based on test scores achieved by students who were instructed in English and who wrote the English form of the achievement test, and those students who were instructed in a language other than English or French and who wrote the English form of the test. They are indicated by the shaded area of the table.

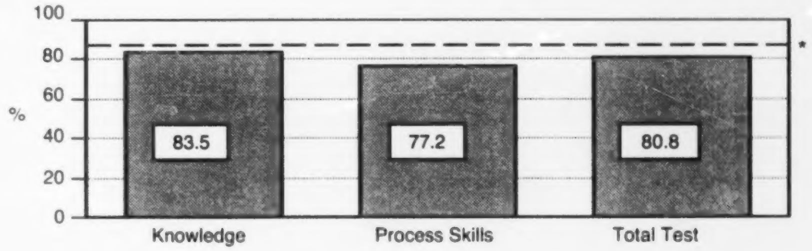
Results in Relation to Standards

Achievement test results are reported in relation to assessment and achievement standards. The **Provincial Assessment Standard** is the lowest score on a test that a student must achieve for his/her performance to be judged "acceptable" and/or "excellent". The **Provincial Achievement Standard** refers to the percentage of students writing the test who are expected to achieve the Provincial Assessment Standard.

Figures 3-1 and 3-2 and Table 3-4 show the percentage of students achieving provincial assessment standards in relation to provincial achievement standards on the total test and on components of the test. These data are based on the results of the 32 630 students in regular programs who wrote the test. They show that the percentage of students achieving the *standard of excellence* on the knowledge questions was considerably higher than expected. Fewer students than expected achieved all other standards set for the Grade 6 Social Studies Achievement Test.

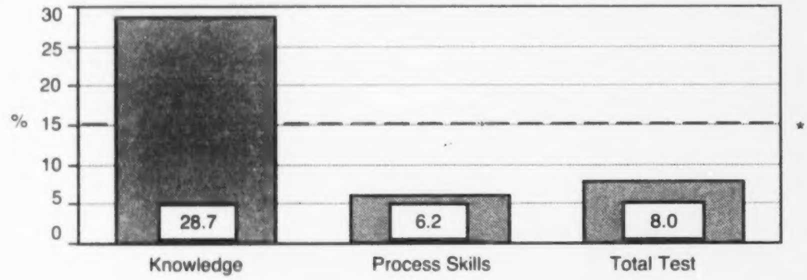
When interpreting these findings, it is important to remember that they are based on the test scores of only a portion (83.5%) of the students reported to have been enrolled in Grade 6 in June 1993, i.e., those students in regular programs who wrote the achievement test. These figures tell us nothing about the levels of achievement of students in Francophone and French Immersion programs, of students who were absent on the day of writing, or of those students who were exempted from writing.

Figure 3-1
Grade 6 Social Studies
Percentage of Students Achieving Acceptable Standard on the Total Test and on Components of the Test
June 1993



* Provincial Achievement Standard—85% of the students who wrote the test are expected to achieve the acceptable standard

Figure 3-2
Grade 6 Social Studies
Percentage of Students Achieving Standard of Excellence on the Total Test and on Components of the Test
June 1993



* Provincial Achievement Standard—15% of the students who wrote the test are expected to achieve the standard of excellence

Earlier studies on the language of testing show that the standards developed for the English version of the test cannot be directly applied to French Immersion students writing the translation; standards for the French Immersion and Francophone students were not set separately due to the small numbers involved. Thus, these students are not included in any discussion of the numbers of students achieving standards.

Table 3-4
Grade 6 Social Studies
Students Achieving Standards on the Total Test and on Components of the Test
June 1993

Reporting Category	Maximum Possible Score	Provincial Assessment Standard* (Raw Score)	Provincial Achievement Standard** (Percent)	Students Achieving Assessment Standard		
				Expected Number	**Actual Number**	**Actual Percent**
Standard of Excellence						
Total Test	100	80	15	4 895	2 621	8.0
Skills Only	64	50	15	4 895	2 015	6.2
Knowledge Only	24	20	15	4 895	9 352	28.7
Acceptable Standard						
Total Test	100	49	85	27 736	26 368	80.8
Skills Only	64	30	85	27 736	25 195	77.2
Knowledge Only	24	13	85	27 736	27 249	83.5
Below Acceptable Standard on Both Components	N/A	N/A	N/A	N/A	3 483	10.7

***The Provincial Assessment Standard** is a score determined by standard-setting procedures and is the lowest score a student must achieve for his/her performance to be judged "acceptable" and/or "excellent" in relation to curricular expectations. See Appendix A.

****The Provincial Achievement Standard** refers to the percentage of students expected to achieve the Provincial Assessment Standard.

It should be noted that the actual percentages of students achieving standards on the total test for Grade 6 Social Studies (8.0% and 80.8%) are based on 32 630 students in the regular programs who wrote the test.

If the percentages are based on the total June population reported by principals (not including the French Immersion and Francophone students who wrote the test), the percentages achieving standards would be:

7.1% achieving the *standard of excellence,*
71.9% achieving the *acceptable standard.*

If the percentages are based on the September 30, 1992, Grade 6 enrollment (36 052) not including the Francophone and French Immersion students who wrote the test, the percentages achieving standards would be:

7.3% achieving the *standard of excellence,*
73.1% achieving the *acceptable standard.*

It is emphasized that the percentages based on enrollment present the lowest estimate of achievement. It is highly likely that some of the students who were absent, exempt, or not accounted for could have achieved standards.

The number of students achieving the *acceptable standard* and the *standard of excellence* for each school was analyzed to determine whether schools were below, meeting, or exceeding provincial achievement standards. Schools classified as meeting provincial achievement standards were those for which the difference between the actual number of students and the expected number of students at or above standards was not statistically significant. Differences are only reported when there is a 5% or smaller probability that a difference of that size could occur by chance. The results are reported in Table 3-5.

Table 3-5 shows the 81.2% of schools were considered to have achieved the provincial achievement standard for the total test at the *standard of excellence*. About one-quarter of schools were significantly below the provincial achievement standard. School administrators and teachers should critically examine social studies achievement test results to determine what they are going to do to improve the level of student achievement. Although this is true for all schools, it is particularly important for those schools performing below the provincial achievement standard.

Table 3-5
Grade 6 Social Studies
Percentage Distribution of Schools* Meeting Provincial Achievement Standards on the Total Test (N = 993)
June 1993

Standard	Percentage Distribution of Schools		
	Significantly Below Provincial Achievement Standard	Not Significantly Different From Provincial Achievement Standard	Significantly Above Provincial Achievement Standard
Standard of Excellence	18.8	78.7	2.5
Acceptable Standard	26.4	67.5	6.1

*Schools with fewer than five students are excluded, as the statistical significance of the difference between the number actually meeting the standard and the number expected to meet the standard when calculated and reported is not educationally meaningful.

Results for Part A: Individual Multiple-Choice Questions

Tables 3-6A to 3-6C show the percentage of students who chose each alternative (A, B, C, and D) for each multiple-choice question.

The results shown in these tables can best be used in conjunction with the tables in jurisdiction and school reports. Variations in patterns of students' responses to questions can help to indicate strengths and weaknesses in local educational programs.

Statistics represented in these tables are based on results achieved by 30 763 students (those who wrote the regular form and those who wrote Form F).

The sum of the percentages for each question may be less than 100% because the No Response category is not reported in these tables.

For a discussion of individual multiple-choice questions, see Examiner's Observations, pages 38 to 40.

Table 3-6A
Grade 6 Social Studies
Results for Individual Multiple-Choice Questions
Topic A—Local Government
June 1993

Item	Distribution of Responses (%)				Component	Category	Curriculum Standard
	A	B	C	D			
1	8.2	17.2	**72.5***	2.1	Knowledge	C	know examples of physical needs
2	30.0	**39.3***	9.6	20.7	Knowledge	C	know examples of social needs
3	**76.1***	3.7	10.3	9.8	Knowledge	C	know examples of government services
36	14.1	10.5	**60.2***	15.1	Knowledge	C	understand the right of free speech
18	5.2	9.0	**76.9***	8.8	Knowledge	G	understand the democratic process
37	6.6	10.5	8.2	**74.6***	Knowledge	G	understand the responsibilities of a citizen in a democracy
39	17.3	7.1	1.4	**74.1***	Knowledge	G	identify a lobby group activity
49	12.7	16.7	**30.0***	**40.2***	Knowledge	G	understand appropriate lobby group activity
40	12.0	**61.2***	9.2	17.1	Process Skills	L	compare information on a graph to a chart
42	18.3	21.1	**51.6***	8.9	Process Skills	L	interpret information to distinguish fact from opinion
46	11.5	**57.1***	28.3	2.8	Process Skills	L	use scale to calculate distance
47	22.9	17.7	**35.4***	23.6	Process Skills	L	interpret maps to discover relationships of scale
48	**87.5***	5.6	3.7	2.8	Process Skills	L	select an efficient means of communicating information
19	**47.4***	11.3	21.7	19.3	Process Skills	A	draw a conclusion about democracy
23	**72.3***	18.4	3.4	6.0	Process Skills	A	draw a conclusion based on given information
38	11.4	11.7	**70.9***	5.7	Process Skills	A	analyze the result of actions in a democracy
41	25.3	**36.5***	17.0	20.9	Process Skills	A	judge how useful the data in a chart would be for different purposes
50	13.2	26.4	**30.6***	29.3	Process Skills	A	evaluate sources of information

*correct answer (Item 49 has two correct answers)

Category Legend:		
	F—Facts	L—Locating, Organizing, Interpreting Information
	C—Concepts	A—Analyzing, Synthesizing, Evaluating
	G—Generalizations	

Continued

Table 3-6B
Grade 6 Social Studies
Results for Individual Multiple-Choice Questions
Topic B—Greece: An Ancient Civilization
June 1993

Item	Distribution of Responses (%)				Component	Category	Curriculum Standard
	A	B	C	D			
4	7.1	14.2	5.0	**73.5***	Knowledge	F	understand psychological needs
9	**53.9***	14.1	**25.2***	6.7	Knowledge	F	identify a psychological need in Ancient Greece
10	2.5	4.6	1.2	**91.7***	Knowledge	F	understand the role of slaves in Ancient Greece
11	**56.6***	7.9	14.3	21.2	Knowledge	F	know how Ancient Greeks met some physical needs
17	13.9	10.7	10.6	**64.7***	Knowledge	F	understand the role of the Assembly in Ancient Greece
20	8.3	**80.7***	5.7	5.0	Knowledge	F	understand that democracy is common to Canada and Ancient Greece
27	**93.6***	2.4	1.8	2.2	Knowledge	F	understand the role of slaves in Ancient Greece
21	11.2	**59.4***	17.4	11.9	Knowledge	G	understand the purpose of government
25	10.6	20.5	**66.0***	2.7	Knowledge	G	understand class structure in Ancient Greece
7	**36.6***	19.0	33.1	11.1	Process Skills	L	interpret comments to identify an opinion
26	25.6	32.6	**33.6***	8.0	Process Skills	L	interpret comments to identify a fact
44	22.6	25.4	20.3	**31.3***	Process Skills	L	use latitude and longitude to locate geographical places
5	8.3	16.7	6.0	**68.7***	Process Skills	A	synthesize information to select the best conclusion
6	8.7	**77.6***	4.9	8.7	Process Skills	A	draw a conclusion based on various comments
24	5.3	**86.4***	6.8	1.4	Process Skills	A	evaluate statements of opinion

*correct answer (Item 9 has two correct answers)

Category Legend:
F—Facts
C—Concepts
G—Generalizations
L—Locating, Organizing, Interpreting Information
A—Analyzing, Synthesizing, Evaluating

Continued

Table 3-6C
Grade 6 Social Studies
Results for Individual Multiple-Choice Questions
Topic C—China: A Pacific Rim Nation
June 1993

Item	Distribution of Responses (%)				Component	Category	Curriculum Standard
	A	B	C	D			
8	12.1	3.1	**81.8***	2.9	Knowledge	F	understand role of grandparents in meeting social needs in China
16	19.3	24.4	7.7	**48.5***	Knowledge	F	understand the importance of terracing in China's farming
30	5.5	15.0	5.3	**74.0***	Knowledge	F	know why Canada - China twinning is important
31	4.1	**55.4***	33.3	7.0	Knowledge	F	understand why China is "opening to the world"
32	24.4	8.3	**62.1***	5.0	Knowledge	F	understand the importance of the Pacific Rim
34	7.9	9.4	24.1	**58.4***	Knowledge	F	know which province borders on the Pacific Ocean
35	**82.9***	3.8	4.2	9.0	Knowledge	F	know that silk originated in China
13	7.3	**47.0***	4.3	41.3	Process Skills	L	interpret comments about technology
14	23.9	17.7	13.0	**45.3***	Process Skills	L	interpret Chinese comments about Canada
28	14.0	**71.0***	2.8	12.1	Process Skills	L	interpret a chart to select main idea
29	10.9	7.1	**79.5***	2.4	Process Skills	L	interpret a chart to apply its information
43	**54.6***	15.8	16.7	12.6	Process Skills	L	locate a Pacific Rim country on a map
12	12.7	6.2	**71.3***	9.7	Process Skills	A	evaluate information from different speakers' comments
15	**54.8***	27.2	5.2	12.7	Process Skills	A	evaluate statements about Chinese policy

*correct answer

Category Legend:
F—Facts
C—Concepts
G—Generalizations
L—Locating, Organizing, Interpreting Information
A—Analyzing, Synthesizing, Evaluating

Multiple-Choice Reporting Categories

Table 3-7 shows the total marks possible and the raw score averages for the multiple-choice reporting categories.

It is important to stress that the averages in the various reporting categories cannot be directly compared with one another. Rather, the results shown in Table 3-7 can best be used in conjunction with parallel tables in the jurisdiction and school reports. Variations in patterns of results can help indicate strengths and weaknesses in local educational programs.

Statistics presented in this table are based on results achieved by 30 763 students (those who wrote the regular form and those who wrote Form F of the test).

Table 3-7
Grade 6 Social Studies
Raw Score Results by Multiple-Choice Reporting Category
June 1993

Reporting Category	Maximum Possible Raw Score	Raw Score Average	Raw Score Standard Deviation
Topic A—Local Government	18	10.9	3.2
Topic B—Greece: An Ancient Civilization	15	10.0	2.5
Topic C—China: A Pacific Rim Nation	14	8.9	2.8
Knowledge: (Facts, Concepts, Generalizations)			
Topic A	8	5.4	1.8
Topic B	9	6.7	1.6
Topic C	7	4.6	1.7
Process Skills:			
Locating/Organizing/Interpreting	13	6.9	2.4
Analyzing/Synthesizing/Evaluating	10	6.2	2.0
Major Components:			
Knowledge	24	16.7	4.1
Process Skills	23	13.1	3.8
Total Multiple Choice	47	29.8	7.3

Results for Part B: Written Response

The number and percentage distribution of scores, by written-response reporting category, are presented in Table 3-8. These data are based on the results achieved by all 32 630 students who wrote English forms of the 1993 Grade 6 Social Studies Achievement Test. The average weighted score on the written-response portion of the test was 16.5, with a standard deviation of 4.9.

The percentage of students achieving standards on "State and Support an Opinion/Position" was only 58.4% compared to 41.6% who failed to achieve the *acceptable standard*; 72.7% of students achieved standards on "Quality of Language and Expression" compared to 27.4% of students who did not achieve standards. See page 41 for the Examiner's Observations on the written response.

Although the papers were scored on a one-marker system, randomly selected papers were re-marked so that a second set of scores was available to confirm scoring consistency. Of the scores awarded on the second reading, 42.4% were identical to the scale scores originally awarded and 46.5% varied by only one point. The one-marker system produces results that are reasonably reliable for groups of 25 or more students. Achievement test scores, however, are less reliable for individual students.

It is possible to draw conclusions about program strengths and weaknesses by comparing local percentage distributions of scale points in each reporting category with provincial distributions. The comparisons are most clearly understood in the context of the assignment students responded to and the scoring guides used to grade their work. Copies of the writing assignment and scoring guides are available from Student Evaluation Branch, Alberta Education.

Table 3-8
Grade 6 Social Studies
Number and Percentage Distribution of Scores by Written-Response Reporting Category
June 1993

Score Scale Points	State and Support an Opinion/Position		Quality of Language and Expression	
	Number	Percent	Number	Percent
5 (Excellent)	923	2.8	970	3.0
4 (Good)	4 304	13.2	4 764	14.6
3 (Acceptable)	13 847	42.4	17 976	55.1
2 (Limited)	11 080	34.0	7 500	23.0
1 (Poor)	2 355	7.2	1 299	4.0
INS (Insufficient)	121	0.4	121	0.4

Examiner's Observations

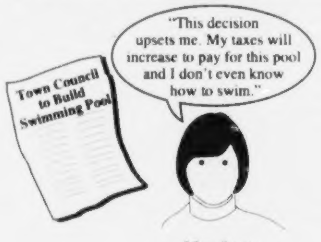
Achievement in Grade 6 Social Studies is slightly better than 1989. However, not enough students achieved either the *acceptable standard* or the *standard of excellence* on the total test.

Multiple Choice

Students found the process skills questions on the multiple-choice section of the test very challenging. Sample questions from the test and accompanying discussion are provided to highlight the strengths and weaknesses of students who achieved the *acceptable standard* and the *standard of excellence*. For each sample question, the correct answer is marked with an asterisk. The percentage of students choosing each alternative is also provided.

Use the following information to answer question 37.

When the people of Big Lake discussed the need for a swimming pool, some supported the idea while others were against it. The town council voted in favour of building the swimming pool.


Town Council to Build Swimming Pool
"This decision upsets me. My taxes will increase to pay for this pool and I don't even know how to swim."

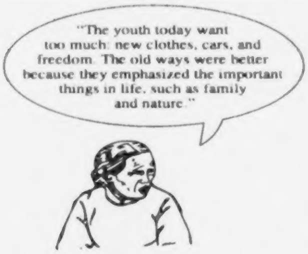
Mrs. Jones

37. If the town council does not change its decision, Mrs. Jones has a responsibility to

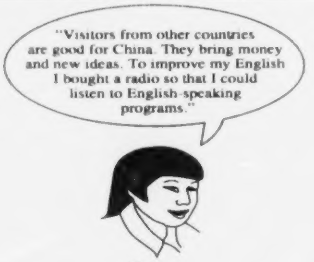
6.6 **A.** learn to swim
10.5 **B.** refuse to pay her taxes
8.2 **C.** refuse to use the new pool
74.6 ***D.** accept the council's decision even if she is upset

---

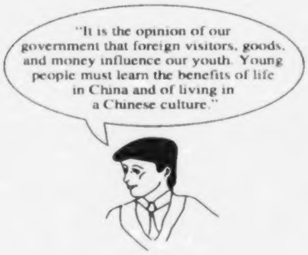
Use the following information to answer question 15.


"The youth today want too much: new clothes, cars, and freedom. The old ways were better because they emphasized the important things in life, such as family and nature."

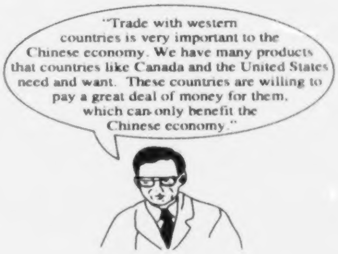
Ling
Farmer


"Visitors from other countries are good for China. They bring money and new ideas. To improve my English I bought a radio so that I could listen to English-speaking programs."

Fong
Tour Guide


"It is the opinion of our government that foreign visitors, goods, and money influence our youth. Young people must learn the benefits of life in China and of living in a Chinese culture."

Sin
Minister of Culture


"Trade with western countries is very important to the Chinese economy. We have many products that countries like Canada and the United States need and want. These countries are willing to pay a great deal of money for them, which can only benefit the Chinese economy."

Han
Businessman

15. Sin would **most likely** agree with which statement?

54.8 ***A.** The government should strongly promote Chinese values among its young people
27.2 **B.** The government should encourage bringing cultural groups into China.
5.2 **C.** Chinese people should be allowed to buy whatever they like.
12.7 **D.** China should import more products to change young people

Acceptable Standard

For **question 37**, students needed to have a basic understanding of rights and responsibilities. Students achieving the *acceptable standard* have a good understanding of the necessary balance between rights and responsibilities in local government issues.

For **question 15**, students were required to analyze information and draw an inference. Results indicated that students who achieved the *acceptable standard* but not the *standard of excellence* had difficulty making inferences. However, students achieving the *standard of excellence* were clearly able to do so.

The strengths of students who achieved the *acceptable standard* include an ability to:

- apply their knowledge of basic concepts such as human needs, class structure, rights, responsibilities, lobby groups, and sharing
- synthesize information to draw simple conclusions
- compare and contrast ways different societies meet needs.

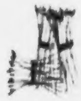
Many students, however, did not do as well as expected in:

- recalling some basic knowledge as outlined in the course of study, such as knowledge about Pacific Rim and government
- analyzing and synthesizing information to make inferences and determine the main idea
- comparing information, charts, and graphs
- distinguishing between fact and opinion
- comparing maps of different scales and computing distances.

BEST COPY AVAILABLE

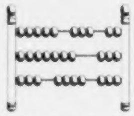
11. The picture below that shows what the Ancient Greeks would have used to satisfy a physical need

56.6 ***A.**



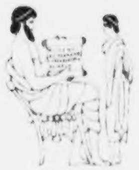
Sheaves of wheat

7.9 **B.**



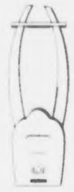
Abacus beads

14.3 **C.**



Scroll

21.2 **D.**



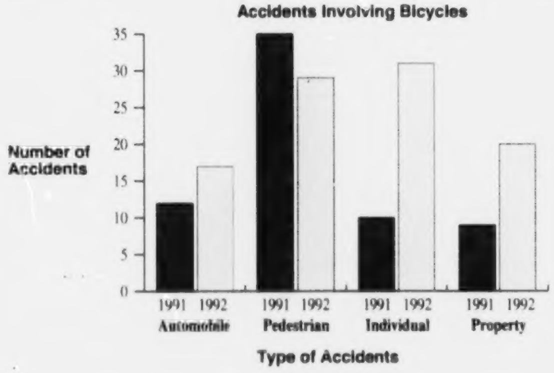
Musical instrument

Use the following information to answer question 41.

The people of Brownsville are concerned about the increase in bicycling accidents over the last two years, as shown in the following chart and graph:

Accidents Involving Bicycles

Type of Accidents	**Number of Accidents** 1991	**Number of Accidents** 1992
Automobile and bicycle accidents	13	17
Pedestrian and bicycle accidents	29	35
Individual bicycle accidents	10	31
Property damaged by bicycles	9	20



Note to the reader: Pedestrian bars were intentionally reversed for another test question that probed the display of data

41. A group who could **best** use the statistics from the chart would be

25.3 **A.** hospital managers requesting increased funding
36.5 ***B.** citizens who support a bylaw to restrict bicyclists
17.0 **C.** citizens who oppose a bylaw to restrict bicyclists
20.9 **D.** police officers when they charge bicycle offenders

Standard of Excellence

For **question 11**, students had to have a basic understanding of human needs. A high percentage of students achieving the *standard of excellence* were able to identify a physical need. However, only slightly more than half of students achieving the *acceptable standard* were able to identify how the ancient Greeks satisfied a physical need.

For **question 41**, students needed to make inferences by analyzing and comparing information contained in a chart and a graph. Many students who achieved the *acceptable standard* and some students who achieved the *standard of excellence* had problems selecting the correct inference. Too many students in both groups were drawn to the first alternative.

Students who achieved the *standard of excellence* were able to:
- clearly understand concepts as outlined in the course of study
- select main ideas by reading information
- analyze and synthesize information to make simple inferences and draw conclusions
- identify points of view
- compute distances on maps.

However, some of these students did not do as well as expected in:
- distinguishing between fact and opinion
- making an inference by comparing information from a chart and a graph (see question 41)
- comparing maps of different scales.

Written Response

Although the quality of writing in social studies is slightly better in 1993 than it was in 1989, not enough students achieved the *acceptable standard*. Teachers were disappointed with many of the papers that they marked. The markers' specific observations include the following:

- too few students handled the composition adequately
- many students had difficulty organizing ideas
- writing was general rather than specific and some students used unrelated personal examples
- some students showed a lack of understanding of government and some confused the levels of government
- many students had difficulty communicating ideas in support of their position
- a small number of excellent papers were written

A majority of teachers indicated that the writing task may have been too general and, rather than delimiting the topic, many students responded with broad statements that did not communicate clearly or effectively. These concerns will be addressed in future designs for written-response questions.

Issues

During the 1993 Grade 6 Social Studies marking session, teachers were asked to comment on the writing assignment. The markers made a number of suggestions regarding students' writing in support of a position. For example, they indicated that taking a position on an issue should follow the generation of ideas and consideration of alternatives. Qualified positions can be supported as well as "for" and "against" positions. Students in Grade 6 classrooms can best address issues when they are specific and in familiar contexts.

Performance-Based Assessment

General Description

A total of 79 Grade 6 teachers and 1 809 students from a sample of schools throughout the province were involved in an assessment of process skills. Student and teacher survey instruments were constructed to help assess the extent to which the identified processes have been acquired by students. The results are presented in Tables 3-9 (students) and 3-10 (teachers).

Students were asked to complete a self-assessment of 11 process skills areas. Teachers used three descriptors to rate each of their students on the same 11 processes areas.

This assessment was intended to help describe the relationship between student results on the 1993 Grade 6 Achievement Test and student acquisition of process skills.

Examiner's Observations

The instruments used by the teachers and the students provided a limited amount of information regarding the identified process skills. However, many of the Grade 6 teachers who participated in the study were pleased with the initiative and enthusiastic about the general trend to assess a broader range of skills. Some teachers indicated that the study should have been based on the skills as defined in the *Program of Studies*.

Results show that students rate themselves highest in the processes of listening to others, persistence, questioning and problem posing, and inquisitiveness. Teachers rated students highest in the processes of questioning and problem posing, precision of language and thought, metacognition, and inquisitiveness. The ability to deal with several sources at one time and to consider alternative points of view (flexibility in thinking) was the area rated lowest by both students and teachers. The results from this assessment will be used as a basis to design future performance assessments that reflect broad learner expectations in the social studies program.

Relationship between Performance-Based Assessment and the Achievement Test

Correlations between teacher ratings of students' process skills and the achievement test scores were calculated. Generally, there is a positive relationship between a student's reported attainment of the identified process skills and his/her performance on the achievement test. For example, teacher ratings of student metacognitive skills correlated 0.51 with student achievement test scores. The relationship between questioning and problem posing skills and achievement test scores was correlated at 0.44.

Table 3-9
Grade 6 Social Studies
Student Survey on Performance-Based Assessment
Percentage Distribution of Student Responses
June 1993

Descriptors For Rating Scale

Often: I consistently demonstrate this attribute
Sometimes: I usually demonstrate this attribute, but not with consistency
Not Yet: I rarely, if ever, demonstrate this attribute

Attributes	Rating Scale			
	Often	Sometimes	Not Yet	No Response
1. Continuing to work when the solution to a problem is not easily found				
a. I stay on task but may take a break	29.5	64.8	5.0	0.7
b. I seek other sources of information when I need help	39.5	55.2	4.8	0.5
c. I do not need to be reminded to complete tasks/projects	33.4	53.9	11.9	0.8
2. Thinking before acting				
a. I listen and understand directions before starting	53.9	42.7	2.7	0.7
b. I listen to what other students say and do not ask unnecessary or the same questions	48.9	41.2	9.1	0.8
c. I ask questions to make the assignment clear to me	53.5	40.3	5.6	0.6
d. I study the problems and develop a plan to solve them	32.9	57.0	9.4	0.7
e. I think before answering	63.2	33.3	2.6	0.9
3. Listens with understanding and feeling				
a. I repeat other students' ideas in my own words	19.5	61.1	18.7	0.7
b. I use body language to respond	25.3	51.4	22.6	0.6
c. I ask questions that are on the topic	61.8	33.6	3.8	0.8
d. I answer with acceptable actions or words	48.5	45.9	4.5	1.0
4. Awareness of our own thinking				
a. When faced with a problem, I can explain what the problem is	33.7	59.8	5.7	0.8
b. I can explain the parts of the problem that I already know	62.8	33.8	2.4	0.9
c. I can identify the parts of the problem that I need to know	45.9	48.8	4.2	1.1
d. I develop and carry out plans to solve problems	34.3	57.3	7.3	1.1
e. I change my plan when it needs to be changed	54.1	39.5	5.3	1.0
f. I think about what I did to solve the problem	36.6	49.4	13.2	0.8
5. Language is clear, descriptive and complete				
a. I use specific words	31.3	62.6	5.2	0.8
b. I choose the best possible words to describe my speech	38.7	54.1	6.4	0.8
c. It is important for me to be understood	67.7	27.9	2.9	1.5
d. When needed, I clearly express my ideas in detail	40.8	51.0	6.9	1.3
6. The ability to deal with several sources at one time and to consider alternative points of view				
a. I am willing to change my mind when given good reasons	58.3	37.8	3.1	0.8
b. I offer and accept more than one alternative to problems	42.4	50.5	5.8	1.3
c. I am willing to accept there may be more than one answer to a problem	63.0	32.7	3.1	1.2
d. I am willing to accept other people's solutions to problems	58.0	37.3	3.0	1.8

Continued

Table 3-9 (continued)

Attributes	Rating Scale			
	Often	**Sometimes**	**Not Yet**	**No Response**
7. Has the interest and ability to find problems to solve				
a. I am not afraid to ask questions	48.0	42.9	8.3	0.8
b. My questions are serious ones that I really want answered	43.0	51.0	4.9	1.0
c. I ask questions until I am pleased with the answer	33.2	49.8	15.8	1.2
d. Some of my questions are much harder than others	34.2	52.9	11.8	1.0
8. All aspects of work are reviewed and checked				
a. I reread instructions and make sure everything has been done	38.0	54.5	6.5	1.0
b. I want all my work to be my best	63.6	33.6	1.9	0.9
c. I try to correct errors before I finish a task	44.5	48.6	5.7	1.2
9. The ability to understand one experience and apply it to new situations				
a. In a new situation, I figure out what I already know	42.2	52.8	4.0	1.0
b. I remember and use important previous experiences	45.6	48.1	4.9	1.3
c. I use ideas from the past to help me solve new problems	49.4	44.2	5.3	1.1
10. Creativity				
a. I do work and activities because I want to	49.2	44.1	5.7	1.0
b. I am willing to try things even when I am unsure of the result	51.5	43.5	4.0	1.0
c. I want others to tell me how I am doing	48.6	40.9	9.2	1.3
11. Feel good about our thinking ability				
a. I enjoy finding problems to solve	23.8	55.6	19.5	1.1
b. I believe I can solve most problems	33.6	57.4	8.9	1.1
c. I am curious and interested in most things	62.1	33.3	3.6	1.0

Table 3-10
Grade 6 Social Studies
Teacher Survey on Performance-Based Assessment
Percentage Distribution of Teacher Responses
June 1993

Descriptors For Rating Scale

Often: Student consistently demonstrates this attribute
Sometimes: Student usually demonstrates this attribute, but not with consistency
Not Yet: Student rarely, if ever, demonstrates this attribute

Attributes	Rating Scale			
	Often	Sometimes	Not Yet	No Response
1. **Persistence:** Continuing to work when the solution to a problem is not easily found				
a. stays on task but may take a break	46.0	43.2	10.4	0.5
b. seeks other sources of data	34.4	49.0	16.1	0.5
c. works independently to complete tasks/projects	50.0	37.2	12.3	0.5
2. **Decreasing Impulsivity:** Thinking before acting				
a. listens and understands directions before starting	49.3	43.9	6.3	0.5
b. listens to the responses of others; therefore reduces the number of unnecessary or repetitive questions	48.5	41.5	9.2	0.7
c. asks questions to clarify the task or direction	43.8	43.9	11.8	0.5
d. analyzes the problem and develops a plan	39.8	44.8	14.7	0.8
e. thinks before answering	49.8	41.1	8.2	1.0
3. **Listening To Others:** Listens with understanding and empathy				
a. paraphrases others' responses	24.0	53.2	22.3	0.5
b. uses body language to respond	33.9	53.7	11.6	0.8
c. asks questions related to the topic	46.4	42.7	10.4	0.5
d. responds by acceptable actions or words	49.8	42.7	6.9	0.6
4. **Metacognition:** Awareness of our own thinking				
a. verbalizes an understanding of the problem	39.0	48.6	11.8	0.6
b. describes what is known to solve the problem	40.6	47.2	11.6	0.6
c. identifies what else needs to be known	35.8	47.9	15.5	0.9
d. develops and carries out a plan of action	41.1	45.0	13.3	0.6
e. recognizes when the plan may need modification	33.0	45.0	21.4	0.6
f. reflects/evaluates strategies used to solve the problem	27.2	45.3	26.6	0.9
5. **Precision to Language and Thought:** Language is clear, descriptive and complete				
a. uses specific words (nouns, etc.)	39.8	51.1	8.5	0.6
b. descriptors are used to enhance speech	32.1	50.4	16.8	0.7
c. strives for coherence and conciseness	37.5	45.2	16.6	0.8
d. elaborates and clarifies ideas	31.7	47.4	20.0	0.9

Continued

Table 3-10 (continued)

Attributes	Rating Scale			
	Often	Sometimes	Not Yet	No Response
6. **Flexibility In Thinking:** The ability to deal with several sources at one time and to consider alternative points of view.				
a. is willing to change his/her mind when presented with reasons to do so	53.1	42.2	3.8	0.9
b. offers/accepts more than one alternative to a problem	52.3	39.2	7.4	1.1
c. is willing to accept that there may be more than one answer	58.8	35.5	4.5	1.1
d. is able to compromise (give up ownership)	53.3	39.1	6.4	1.2
7. **Questioning And Problem Solving:** Has the inclination and ability to find problems to solve				
a. student is not hesitant to ask questions	49.2	38.4	11.6	0.8
b. questions result from critical observations	35.1	45.7	18.3	0.9
c. questions openly, is willing to probe	38.0	39.4	21.4	1.1
d. demonstrates different levels of questioning	29.2	44.7	24.9	1.3
8. **Checking For Accuracy And Precision:** All aspects of work are reviewed and checked				
a. rereads instructions and makes sure nothing has been omitted	35.9	49.0	14.2	1.0
b. takes pride in the accomplishment	50.5	39.9	8.9	0.8
c. strives for quality through editing and proofing	34.7	42.7	21.6	1.1
9. **Drawing On Past Knowledge and Applying It To New Situations:** The ability to abstract meaning from one experience and apply it to new situations				
a. determines what is known about a situation	42.6	50.1	5.4	1.8
b. takes meaning from relevant past experiences	43.3	47.4	7.7	1.7
c. appropriately applies strategies used in the past in a new situation	38.6	48.8	10.7	1.9
10. **Ingenuity, Originality And Insightfulness:** Creativity				
a. student is self-motivated	47.1	38.3	13.9	0.7
b. takes risks and tests limits	32.4	46.5	20.4	0.8
c. seeks and accepts feedback	41.4	43.1	14.6	0.9
11. **Wonderment, Inquisitiveness, Curiosity And The Enjoyment Of Problem Solving:** A sense of efficacy as a thinker				
a. student derives pleasure from being a problem seeker	34.6	46.1	18.6	0.8
b. student has confidence in his/her ability to solve problems	37.2	43.1	18.9	0.8
c. has a curiosity about and an affinity with the world and the environment	45.4	43.4	10.1	1.1

Contexts for Learning

General Description

In June 1993, a sample of Grade 6 Social Studies teachers and students from across the province completed separate questionnaires designed to identify and examine relationships among various contexts for learning and their effect on student achievement.

Teachers reported on the variety of instructional strategies, writing activities, assessment tools, classroom resources, and other activities they used in their social studies classes. The results are presented in Table 3-11 (teachers).

Students gave their opinions on a variety of topics and on various learning activities related to social studies. The results are presented in Table 3-12 (students).

Teachers indicate that they use a wide variety of social studies related activities in their Grade 6 classes. These activities includes co-operative learning, brainstorming, note taking, and class discussion.

Student responses to the questionnaire indicate that students have a marked tolerance and openness to people different from themselves. A large majority of students indicated that they are accepting of differing opinions and of the importance of being responsible citizens; 84% of the teachers surveyed indicated that most of their students show respect for other's opinions or viewpoints.

Students responses were highest in the area of cooperation. For example, to the statement "It is important for me to do my share in group projects", 95.7% of the students "agreed." In a related area, 92.0% of the teachers surveyed indicated that most of their students demonstrated courteous behaviour when working with others.

Relationship between Learning Environment and the Achievement Test

No relationship or pattern was established by students achieving or not achieving the *acceptable standard* and their responses to the student questionnaire. It is also interesting to note there was no discernable pattern between achievement and instructional strategies.

Table 3-11
Grade 6 Social Studies
Teacher Questionnaire—Contexts for Learning
Percentage Distribution of Responses
June 1993

Statement	Never	Less than once a week	Once a week	Several times a week	Every day	No Response
1. I use the following **instructional strategies** with my Social Studies students.						
a. Full class discussion	—	—	16.0	52.0	32.0	1.0
b. Reading from a textbook	—	32.0	20.0	48.0	1.0	—
c. Worksheets	12.0	32.0	24.0	28.0	—	4.0
d. Cooperative learning	—	20.0	20.0	52.0	8.0	—
e. Library research	4.0	68.0	16.0	12.0	—	—
f. Viewing films or videos	—	80.0	12.0	8.0	—	—
g. Oral presentations	—	64.0	16.0	20.0	—	—
h. Project work	—	52.0	24.0	16.0	4.0	4.0
i. Note taking	—	36.0	36.0	28.0	—	—
j. Brainstorming	—	20.0	28.0	44.0	8.0	—
k. Webbing/mind mapping	—	68.0	12.0	20.0	—	—
l. Learning or listening centres	56.0	28.0	—	4.0	4.0	8.0
m. Independent work	—	8.0	48.0	36.0	8.0	—
n. Problem-solving	—	20.0	32.0	40.0	4.0	4.0
o. Teacher-directed inquiry	—	16.0	32.0	44.0	4.0	4.0
p. Student-directed inquiry	—	40.0	24.0	24.0	4.0	8.0
q. Peer discussion	—	20.0	20.0	44.0	8.0	8.0

Continued

Table 3-11 (continued)

Statement	Never	Less than once a week	Once a week	Several times a week	Every day	No Response
2. My class does the following kinds of **writing** in Social Studies.						
a. Paragraphs	—	28.0	40.0	24.0	—	8.0
b. Reports	—	68.0	12.0	12.0	—	8.0
c. Stories	24.0	60.0	4.0	—	4.0	8.0
d. Writing about a personal experience	24.0	64.0	4.0	—	4.0	4.0
e. Copying notes from the board	12.0	52.0	28.0	8.0	—	—
f. Notes from class/group discussion	—	40.0	24.0	32.0	—	4.0
g. Letters	32.0	52.0	8.0	—	—	8.0
h. Summarizing information from a variety of sources	4.0	28.0	32.0	36.0	—	—
i. Interviews	32.0	56.0	4.0	—	—	8.0
3. I integrate the Social Studies program with other curriculum areas.	4.0	36.0	20.0	24.0	12.0	4.0
4. I encourage students to make decisions and consider the consequences.	—	16.0	16.0	32.0	36.0	—
5. I encourage students to take action on an issue.	—	44.0	20.0	12.0	24.0	—

Statement	Yes	No	No Response
6. Most of my students demonstrate courteous behaviour when working with others.	92.0	—	8.0
7. Most of my students can accept the role of either leader or follower in a group.	76.0	16.0	8.0
8. Most of my students show respect for someone else's opinions or viewpoints.	84.0	8.0	8.0
9. The following **activities** are part of my grade 6 Social Studies program.			
a. Field trips	72.0	28.0	—
b. Simulation, role-play, or cooperative games	84.0	16.0	—
c. Listening to guest speakers	96.0	4.0	—
d. Interviewing parents and/or members of the community	64.0	36.0	—
e. Special celebrations	64.0	32.0	4.0
f. Making maps, charts, timelines, and/or graphs	100.0	—	—
g. Writing a letter	72.0	28.0	—

Continued

Table 3-11 (continued)

Statement	Yes	No	No Response
10. I use the following types of assessments with my Social Studies students.			
a. Multiple choice tests	88.0	12.0	—
b. Vocabulary match	84.0	16.0	—
c. Short answer	96.0	4.0	—
d. True-false	84.0	12.0	4.0
e. Extended response	96.0	4.0	—
f. Interpretations of charts, diagrams, pictures, graphs, and maps	100.0	0.0	—
g. Creation of a diagram, picture, mural, collage, or model to show understanding	88.0	12.0	—
h. Oral presentation	96.0	4.0	—

Statement	Students' Use	Teachers' Use	Both	Neither
11. The following **items** were readily available **in my classroom** for my students and/or for my use in planning and instructing.				
a. Nelson Intermediate Atlas	24.0	12.0	52.0	12.0
b. Dictionary	36.0	—	64.0	—
c. Encyclopedias	16.0	16.0	36.0	32.0
d. Globe	28.0	8.0	56.0	8.0
e. Newspapers	28.0	4.0	40.0	28.0
f. Magazines	24.0	16.0	28.0	32.0
g. Travel Brochures	20.0	16.0	20.0	44.0
h. Films, videos	32.0	16.0	24.0	28.0
i. Maps	28.0	—	64.0	8.0
j. Computer	28.0	4.0	36.0	32.0
k. Topic A: Basic Resources				
i. Politics and You (student text)	56.0	—	24.0	20.0
ii. Politics and You (teacher's guide)	16.0	56.0	—	28.0
iii. The Structure of Government (kit)	20.0	44.0	8.0	28.0
iv. The Winds of Change: Indian Government (student texts)	20.0	20.0	16.0	44.0
v. Working for Canadians: A Study of Local, Provincial , and Federal Government (student texts)	32.0	12.0	24.0	32.0
l. Topic B: Basic Resources				
i. The Greeks: People of the Past series (student texts)	52.0	8.0	32.0	8.0
m. Topic C: Basic Resources				
i. Life in Changing China (student texts)	56.0	4.0	36.0	4.0
ii. Life in Changing China (teacher's manual)	28.0	60.0	8.0	4.0
n. Social Studies Teacher Resource Manual, Grades 4–6	20.0	68.0	4.0	8.0
o. Focus on Research: A Guide to Developing Students' Research Skills	8.0	36.0	4.0	52.0
p. Teaching Thinking: Enhancing Learning	4.0	20.0	4.0	72.0

Table 3-12
Grade 6 Social Studies
Student Questionnaire—Contexts for Learning
Percentage Distribution of Responses
June 1993

	Statement	Disagree	Undecided	Agree	No Response
1.	Participation is an important part of Social Studies.	1.1	11.3	87.6	—
2.	It is important for me to do my share in group projects.	1.4	2.8	95.7	0.1
3.	Social Studies has been interesting this year.	12.3	34.4	53.3	—
4.	Social Studies is a difficult subject.	34.3	39.5	26.0	0.1
5.	Social Studies is useful for solving problems and dealing with situations in everyday life	22.7	36.5	40.5	0.3
6.	Violence should not be used to solve disputes between countries.	4.5	10.7	84.7	—
7.	Immigrants to Canada offer points of view that make Canada a better place.	9.2	41.2	49.2	0.4
8.	Other people have a right to an opinion that is different from mine.	1.0	3.6	95.2	0.3
9.	A person who moves to Canada from another culture should give up his/her own culture.	82.5	12.1	5.1	0.3
10.	I think that it is important to know about other countries and what is going on in the world.	2.3	12.0	85.0	0.7
11.	If people work together, they can help solve some of the world's problems.	1.7	8.5	89.8	—
12.	When people wish to change a law, they should follow the established democratic practices, no matter how long it takes.	6.3	40.6	52.6	0.4
13.	There is no point in trying to think of solutions to local problems because they are too complicated.	73.6	20.1	6.1	0.3
14.	The responsibility for students doing well in school lies mainly with the student him/herself.	6.3	16.0	77.3	0.4
15.	Citizens of Canada are responsible for seeing that Canada's environment is kept clean.	3.6	9.9	86.2	0.3
16.	It is important that I become a responsible citizen.	1.7	9.0	89.3	0.1
17.	People should not have to look after each other. They should look after themselves.	48.3	30.9	20.1	0.7

(Continued)

Table 3-12 (continued)

Statement	Disagree	Undecided	Agree	No Response
18. I think that it is important to know about Canada's past and present.	5.4	18.5	75.8	0.4
19. People in Canada can meet their needs in different ways.	1.5	11.8	86.1	0.6
20. The way that people meet their needs in China is just as good as the way we meet our needs in Canada.	15.7	33.3	50.8	0.1

Section 4

Grade 9 Science

In 1993 a number of assessments were carried out in Grade 9 Science. The achievement test was administered to students province-wide. Performance assessment tests were administered to a sample of Grade 9 Science students. As well, a sample of Grade 9 Science teachers and a sample of Grade 9 Science students participated in a study to examine the relationship among various contexts for learning and achievement. The results from all these assessments follow.

Achievement Test General Description

The Grade 9 Science Achievement Test was divided into two parts. Part A had 60 multiple-choice questions, each with four alternatives. Part B had 5 numerical-response questions, which required students to determine or calculate an answer and then record it on the answer sheet.

The statistics for the total test and for the various components are based on the results achieved by 28 613 students: 25 635 wrote the regular form and 2 978 participated in the achievement-over-time study, as shown in Table 4-2. This section of the report provides answers to the following questions:

- How many Grade 9 students wrote each form of the test or were absent or exempted?
- What percentage of students who wrote the Grade 9 Science test achieved the *acceptable standard*?
- What percentage of students who wrote the Grade 9 Science test achieved the *standard of excellence*?
- What did Grade 9 students know and what could they do in Science?
- What parts of the Science curriculum caused Grade 9 students difficulty?

Summary of Results

Results show that 77.6% of students who wrote the test achieved the *acceptable standard* and 17.1% achieved the *standard of excellence* on the total test. The number of students achieving the *acceptable standard* was lower than expected and the number achieving the *standard of excellence* was higher than expected.

Content of the Test

The Grade 9 Science Achievement Test was designed to reflect the Grade 9 Science curriculum standards. The scope of the test was limited to student learner expectations that could be efficiently measured on a paper and pencil test.

The test consisted of 65 questions in six topics: Diversity of Living Things, Fluids and Pressure, Heat Energy: Transfer and Conservation, Electromagnetic Systems, Chemical Properties and Changes, and Environmental Quality. The questions were designed to measure achievement in two domains: Concepts and Skills.

Test Blueprint

Table 4-1 presents the blueprint used to develop the Grade 9 Science Achievement Test. Classification of each question by component and reporting category is indicated in the table.

Table 4-1
Grade 9 Science Achievement Test Blueprint
June 1993

Assessment Component	Distribution of Questions by Reporting Category		Total Number of Questions and Test Emphasis
	Concepts	**Skills**	
Diversity of Living Things	1, 5, 10, 11, 12, 14, 56	2, 3, 4, 6, 52	12 (18%)
Fluids and Pressure	7, 8, 9, 34, 48, 49, 51, 58	32, 35, 36, NR2	12 (18%)
Heat Energy: Transfer and Conservation	15, 16, 17	18, 45, 46, 50, NR3	8 (13%)
Electromagnetic Systems	19, 39, 40, 59, 60, NR1*	41, 42, 43, 44, 47	11 (17%)
Chemical Properties and Changes	20, 21, 23, 24, 33, 38, 57	22, 37, NR4, NR5	11 (17%)
Environmental Quality	13, 28, 29, 30, 53	25, 26, 27, 31, 54, 55	11 (17%)
Total Number of Questions and Test Emphasis	36 (55%)	29 (45%)	65 (100%)

*NR—numerical-response question

Student Participation

In June 1993, principals reported a total population of 34 362 students in Grade 9. Table 4-2 presents the number and percentage distribution of students who wrote the Grade 9 Science Achievement Test, who were absent, or who were exempted. In total, 87.8% of the students reported to be in Grade 9 in June 1993, wrote the Grade 9 Science Achievement Test.

Results for students in French Immersion or Francophone programs were reported separately to participating schools and jurisdictions.

Table 4-2
Grade 9 Science
Student Participation
June 1993

Category	Number of Students		Percentage of Students	
Total Number of Students in Regular Programs*		28 613		83.3
Students Who Wrote the Regular Form	25 635		74.6	
Students Who Wrote the Achievement-Over-Time Forms:	2 978		8.7	
Form T (Green)—Same as the Regular Form	1 018		3.0	
Form S (Pink)	981		2.9	
Form R (Blue)	979		2.8	
Other Students Who Wrote:		1 527		4.5
Francophone—Taught in French, Wrote in French	123		0.4	
Francophone—Taught in French, Wrote in English	0		0.0	
French Immersion—Taught in French, Wrote in French	1 403		4.1	
French Immersion—Taught in French, Wrote in English	1		0.0	
Students Absent		2 041		5.9
Students Exempted from Writing		2 181		6.3
Categories of Exemption:				
1. Special Needs Students	1 171		3.4	
2. Subject Was Not Taught This Term	427		1.2	
3. English as a Second Language Students	298		0.9	
4. Language of Instruction Was Not English	1		0.0	
5. Other (as approved by the Superintendent)	284		0.8	
Total Principals' Reported Population Test Day, June 1993:		34 362		100.00
Grade 9 Enrollment: September 30, 1992		35 182		

*Provincial results are based on test scores achieved by students who were instructed in English and who wrote the English form of the achievement test, and those students who were instructed in a language other than English or French and who wrote the English form of the test. They are indicated by the shaded area of the table.

Results in Relation to Standards

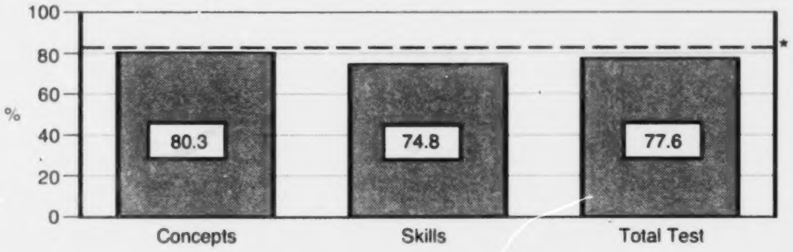
Achievement test results are reported in relation to assessment and achievement standards. The **Provincial Assessment Standard** is the lowest score on a test that a student must achieve for his/her performance to be judged "acceptable" and/or "excellent" in relation to curricular expectations. The **Provincial Achievement Standard** refers to the percentage of students writing the test who are expected to achieve the Provincial Assessment Standard.

Figures 4-1 and 4-2 and Table 4-3 show the percentage of students achieving provincial assessment standards in relation to the provincial achievement standards on the total test and on components of the test. These data are based on the results of the 28 613 students in regular programs who wrote the test.

The percentage of students achieving the *acceptable standard* was lower than expected and the percentage of students achieving the *standard of excellence* was higher than expected.

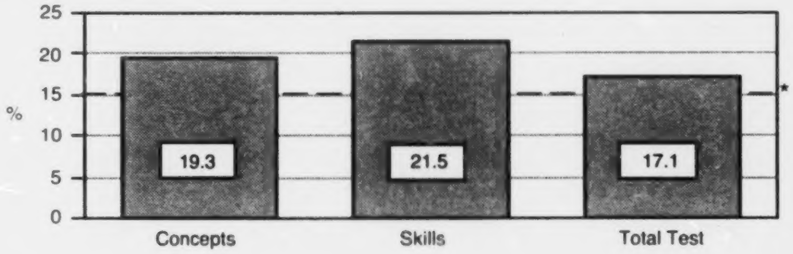
When interpreting these findings, it is important to remember that they are based on the test scores of only a portion (83.3%) of the students reported to have been in Grade 9 in June 1993, i.e., those students in regular programs who wrote the achievement test. These figures tell us nothing about the levels of achievement of students in Francophone and French Immersion programs, of students who were absent on the day of writing, or of those students who were exempted from writing.

Figure 4-1
Grade 9 Science
Percentage of Students Achieving Acceptable Standard on the Total Test and on Components of the Test
June 1993



*Achievement standard—85% of the students in the province who wrote the test are expected to achieve the acceptable standard

Figure 4-2
Grade 9 Science
Percentage of Students Achieving Standard of Excellence on the Total Test and on Components of the Test
June 1993



*Achievement standard—15% of the students in the province who wrote the test are expected to achieve the standard of excellence

Earlier studies on the language of testing show that the standards developed for the English version of the test cannot be directly applied to French Immersion students writing the translation; standards for the French Immersion and Francophone students were not set separately due to the small numbers involved. Thus, these students are not included in any discussion of the numbers of students achieving standards.

Table 4-3
Grade 9 Science
Students Achieving Standards on the Total Test and on Components of the Test
June 1993

Reporting Category	Maximum Possible Score	Provincial Assessment Standard* (Raw Score)	Provincial Achievement Standard** (Percent)	Students Achieving Assessment Standard		
				Expected Number	Actual Number	Actual Percent
Standard of Excellence						
Total Test	65	52	15	4 292	4 880	17.1
Skills Only	29	23	15	4 292	6 184	21.5
Concepts Only	36	29	15	4 292	5 526	19.3
Acceptable Standard						
Total Test	65	33	85	24 321	22 214	77.6
Skills Only	29	15	85	24 321	21 413	74.8
Concepts Only	36	18	85	24 321	22 987	80.3
Below Acceptable Standard on Both Skills and Concepts	N/A	N/A	N/A	N/A	4 214	14.7

* **The Provincial Assessment Standard** is a score determined by standard-setting procedures and is the lowest score a student must achieve for his/her performance to be judged "acceptable" and/or "excellent" in relation to curricular expectations. See Appendix A.

** **The Provincial Achievement Standard** refers to the percentage of students expected to achieve the Provincial Assessment Standard.

It should be noted that the actual percentages of students achieving standards on the total test for Grade 9 Science (17.1% and 77.6%) are based on the 28 613 students in the regular programs who wrote the test.

If percentages are based on the total June population reported by principals (not including the French Immersion and Francophone students who wrote the test), the percentages achieving standards would be:

14.9% achieving the *standard of excellence,*
67.7% achieving the *acceptable standard.*

If the percentages are based on the September 30, 1992, Grade 9 enrollment (33 655), not including the French Immersion and Francophone students who wrote the test, the percentages achieving standards on the total test would be:

14.5% achieving the *standard of excellence,*
66.0% achieving the *acceptable standard.*

It is emphasized that the percentages based on enrollment present the lowest estimate of achievement. It is highly likely that some of the students who were absent, exempt, or not accounted for could have achieved standards.

The number of students achieving the *acceptable standard* and the *standard of excellence* for each school was analyzed to determine whether achievement in schools was below, meeting, or exceeding provincial achievement standards. Schools classified as meeting provincial achievement standards were those for which the difference between the actual number of students and the expected number of students achieving standards was not statistically significant. Differences are only reported when there is a 5% or smaller probability that a difference of that size could occur by chance.

As can be seen in Table 4-4, about one-third of schools were significantly below the provincial achievement standard. School administrators and teachers should critically examine science achievement test results to determine what they are going to do to improve the level of student achievement. Although this is true for all schools, it is particularly important for those schools performing below the provincial achievement standard.

Table 4-4
Grade 9 Science
Percentage Distribution of Schools* Meeting Achievement Standards on the Total Test
(N = 568)
June 1993

Standard	Percentage Distribution of Schools		
	Significantly Below Provincial Achievement Standard	Not Significantly Different From Provincial Achievement Standard	Significantly Above Provincial Achievement Standard
Standard of Excellence	7.0	77.6	15.3
Acceptable Standard	33.6	63.6	2.8

*Schools with fewer than five students are excluded, as the statistical significance of the difference between the number actually achieving the standard and the number expected to achieve the standard when calculated and reported is not educationally meaningful.

Reporting Categories

Table 4-5 shows the total marks possible and the provincial raw score results for the reporting categories of the Grade 9 Science Achievement Test.

It is important to stress that the averages on the various reporting categories cannot be directly compared with one another. Rather, the results shown in Table 4-5 can best be used in conjunction with parallel tables in the jurisdiction and school reports. Variations in patterns of students' responses to questions can help to indicate strengths and weaknesses in local educational programs. Statistics presented in this table are based on results achieved by 26 653 (students who wrote the regular form and those who wrote Form T).

Table 4-5
Grade 9 Science
Raw Score Results by Reporting Category
June 1993

Reporting Category	Number of Questions	Average Score	Standard Deviation
Topic			
Diversity of Living Things	12	7.1	2.3
Fluids and Pressure	12	7.7	2.5
Heat Energy: Transfer and Conservation	8	4.3	1.6
Electromagnetic Systems	11	7.2	2.2
Chemical Properties and Changes	11	7.5	2.3
Environmental Quality	11	7.3	2.4
Learning Domain			
Skills	29	18.2	5.1
Concepts	36	22.9	6.0

Results for Individual Multiple-Choice and Numerical-Response Questions

Table 4-6 shows the percentage of students who chose each alternative (A, B, C, and D) for each multiple-choice question. The correct response (key) for each question is also identified. Table 4-7 shows the distribution of responses for each numerical-response question. The results shown in these tables can best be used in conjunction with the parallel tables in the jurisdiction and school reports. Variations in patterns of students' responses to questions can help to indicate strengths and weaknesses in local educational programs.

Statistics presented in these tables are based on results achieved by 26 653 students (those who wrote the regular form and those who wrote Form T).

Table 4-6
Grade 9 Science
Results for Individual Multiple-Choice Questions
June 1993

Item	Distribution of Responses (%)				Topic: Diversity of Living Things	
	A	B	C	D	Domain	Curriculum Standard
1	29.2	12.6	2.9	**55.2***	Concepts	define the meaning of "species"
5	18.9	4.1	3.2	**73.7***	Concepts	know which type of plant structure best retains moisture
10	7.5	25.4	24.3	**42.7***	Concepts	know taxonomic levels used in scientific classification
11	**74.7***	7.6	15.8	2.0	Concepts	know how natural selection protects an insect population from changes in the environment
12	**47.8***	9.2	34.1	8.8	Concepts	identify types of specialization within a group of insects
14	7.9	19.7	15.5	**56.9***	Concepts	identify problems with selective breeding
56	4.2	48.1	**31.1***	16.5	Concepts	identify a benefit to society of an application of selective breeding
2	**83.1***	5.0	5.3	6.5	Skills	infer the relatedness of relationships between organisms
3	**46.2***	8.6	6.1	38.9	Skills	infer the relatedness of species on the basis of their classification
4	3.1	8.6	16.3	**72.0***	Skills	classify oak trees using a dichotomous key
6	**59.8***	19.2	17.1	3.9	Skills	infer the adaption of birds to a food source
52	5.0	5.5	**68.3***	21.2	Skills	predict the habitat that an organism has adapted to based on observed characteristics

*correct answer

Continued

Table 4-6 (continued)

Item	Distribution of Responses (%)				Topic: Fluids and Pressure	
	A	B	C	D	Domain	Curriculum Standard
7	**73.6***	21.8	3.4	**1.2**	Concepts	know that increased density results in increased buoyancy
8	5.8	**73.3***	7.5	13.3	Concepts	know how pressure affects fluids in a siphon
9	0.9	1.4	**79.0***	18.6	Concepts	know that pressure decreases as surface area increases
34	25.2	4.6	5.8	**64.3***	Concepts	know the relationship between fluid viscosity and temperature change
48	15.7	**48.8***	8.6	26.8	Concepts	know how valves control the movement of fluids in a pump
49	10.1	21.8	**62.7***	5.2	Concepts	know the effect of resistance on objects moving in fluids
51	23.7	**48.1***	10.2	17.9	Concepts	understand the relationship between buoyant force and the force of gravity
58	8.5	**60.7***	22.0	8.7	Concepts	know how valves control the movement of fluids
32	11.4	**70.1***	4.0	14.3	Skills	infer that the reduced volume of a gas is related to the spaces between particles
35	29.3	**60.6***	6.0	4.0	Skills	predict the effect of temperature changes on the viscosity of motor oil
36	**51.5***	21.3	5.8	21.3	Skills	apply knowledge of the relationship between pressure, force, and area in a hydraulic system

Item	Distribution of Responses (%)				Topic: Heat Energy – Transfer and Conservation	
	A	B	C	D	Domain	Curriculum Standard
15	**25.3***	55.0	2.5	17.1	Concepts	know the effect of structural designs on the amount of cooling in houses
16	11.8	**80.5***	5.8	1.9	Concepts	know how a solar collector converts the sun's energy into heat
17	28.7	**41.6***	13.7	15.9	Concepts	know that metals are poor insulators
18	5.6	11.9	**58.3***	24.2	Skills	relate the effect of variables when conducting an experiment
45	8.1	16.1	**54.6***	21.2	Skills	judge the effects of heat transfer between solids and liquids
46	14.1	**33.1***	27.1	25.7	Skills	infer the relationship between rate of temperature change and the mass of a fluid
50	**83.2***	4.7	5.9	6.0	Skills	apply the principle of specific heat capacity

*correct answer

Continued

Table 4-6 (continued)

Item	Distribution of Responses (%)				Topic: Electromagnetic Systems	
	A	**B**	**C**	**D**	**Domain**	**Curriculum Standard**
19	7.4	4.6	**65.7***	22.2	Concepts	know the purpose of a thermocouple
39	**79.2***	8.8	4.2	7.7	Concepts	know that changing electric current direction affects the direction of a compass needle
40	5.1	4.4	11.0	**79.4***	Concepts	understand how the strength of an electromagnet affects the speed of an electric motor
59	6.2	8.5	**74.5***	10.7	Concepts	know how a bimetal strip can interrupt an electric circuit
60	12.0	12.8	16.7	**58.4***	Concepts	know the function of a fuse in a circuit
41	26.0	14.5	**44.9***	14.4	Skills	predict a hidden circuit connection from circuit test results
42	**60.6***	22.5	13.3	3.6	Skills	interpret information in a graph to show the relationship of resistance and electric current
43	3.9	4.8	**86.7***	4.6	Skills	apply knowledge of how switches work in a circuit
44	**50.9***	21.3	7.0	20.7	Skills	predict the effect of changing a circuit that has electric loads linked in series and parallel
47	8.3	**78.5***	6.2	6.9	Skills	predict the effect on temperature caused by a resistor in a circuit

Item	Distribution of Responses (%)				Topic: Chemical Properties and Changes	
	A	**B**	**C**	**D**	**Domain**	**Curriculum Standard**
20	14.5	**70.9***	7.3	7.3	Concepts	identify a chemical change in different experimental results
21	5.2	**70.7***	15.1	8.8	Concepts	understand the effect of surface area on reaction rates
23	3.9	17.4	2.4	**76.3***	Concepts	identify the presence of acids and bases in household products
24	11.1	21.2	13.0	**54.6***	Concepts	know that the physical property density can be used to classify different materials
33	4.1	14.8	3.3	**77.8***	Concepts	know a method of preventing corrosion
38	15.2	4.7	3.6	**76.5***	Concepts	understand that chemical change in materials produces heat
57	**69.6***	21.3	3.5	5.6	Concepts	understand that heating a solution causes an increase in solubility
22	7.5	**73.3***	7.7	11.5	Skills	organize data that will show the effect of acid on a material
37	1.8	3.9	**84.9***	9.4	Skills	interpret information from a diagram and apply understanding of melting point

*correct answer

Continued

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Table 4-6 (continued)

Item	Distribution of Responses (%)				Topic: Environmental Quality	
	A	B	C	D	Domain	Curriculum Standard
13	**64.0***	14.1	11.9	9.9	Concepts	know the negative impact of chemical use on the environment
28	12.2	12.5	17.7	**57.6***	Concepts	identify the cause of low levels of dissolved oxygen in river water
29	8.8	7.2	**73.7***	10.2	Concepts	know a procedure that could be used to measure the effect of chemical material on fish living in a river
30	2.5	3.2	**86.0***	8.2	Concepts	identify an example of recycling used tires
53	9.9	4.6	11.6	**73.8***	Concepts	identify an environmentally friendly action in response to an environmental problem
25	14.3	17.6	**61.2***	6.7	Skills	interpret data and identify correct experimental procedure
26	**71.6***	11.0	14.9	2.4	Skills	calculate the average number of organisms per drop of water
27	**35.3***	11.9	40.3	12.4	Skills	interpret data by relating the average population of an organism to the amount of water analyzed
31	7.8	14.6	**72.1***	5.4	Skills	infer the cause of increased phosphate and nitrate levels in a river
54	9.0	**67.1***	10.1	13.7	Skills	analyze data to find an increase of toxin levels in higher levels of a food pyramid
55	64.4	18.8	10.1	6.6	Skills	predict the effect of thermo pollution on health of trout living in a lake

*correct answer

Table 4-7
Grade 9 Science
Results for Individual Numerical-Response Questions
June 1993

Item	Distribution of Responses (%)			Topic	Domain	Curriculum Standard	Correct Answer
	Correct Response	Incorrect Response	No Response				
1	44.6	55.1	0.3	Electromagnetic Systems	Concepts	describe effect of resistance on electron flow	4231
2	72.1	27.3	0.6	Fluids and Pressure	Skills	predict changes in buoyant force that result from changes in fluid density	4213
3	57.9	41.4	0.7	Heat Energy	Skills	interpret data and compare heat conduction rates of materials	3142
4	37.6	60.8	1.6	Chemical Properties	Skills	infer and identify changes in materials as chemical or physical	1122
5	54.8	39.3	5.9	Chemical Properties	Skills	calculate the density based on mass and displacement	1.75

Examiner's Observations

Generally, the Grade 9 teachers who reviewed and set standards for the test felt that it was a good reflection of the Grade 9 Science program. They felt that the theme layout provided an excellent method for organizing the questions and giving real-world context to each question. There was a good range of question types and difficulties that were representative of the science, technology, and society emphasis of the program. The use of numerical-response questions gave more information about what students can do in science.

Sample questions and commentary are provided. The correct answer is marked with an asterisk, and the percentages of students choosing each alternative is shown.

Use the following information to answer question 11.

Over the past 20 years, the farmer kept careful records of different insect populations on his farm. His findings and observations are as follows:

- Many insect species exhibit several distinct adult forms within the same species (polymorphism). The farmer noted that each form has adapted for a particular function.
- From 1976 to 1989, the farmer found that he needed to use a higher concentration of insecticide each year to control the grasshopper population.
- In 1987, the farmer discovered aphids in his clover crop. Aphids are tiny insects that use the juices from plants for food. Frequently, aphids can cause a reduction in plant growth.

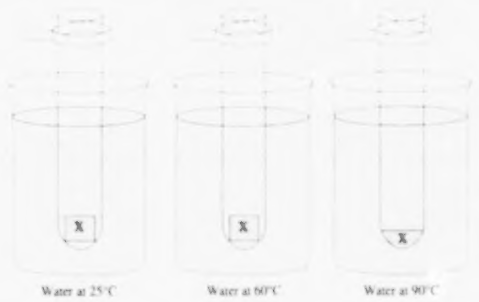
11. The **most** probable reason that the farmer needed to use a higher concentration of insecticide each year from 1976 to 1989 is that the insects

74.7 *A. that survived previous applications passed their resistance on to their offspring
7.6 **B.** were not affected by the insecticide because it was absorbed into the soil, water, and air
15.8 **C.** reproduced quickly enough to replace those killed by the insecticide
2.0 **D.** increased in size and weight

Use the following information to answer question 37.

George plans to use a paste wax to protect the paint on his car. He designs an experiment to test for the melting point of the wax.

X represents a sample of the same wax in each test tube.



37. The melting point of the wax is

1.8 **A.** lower than 25°C
3.9 **B.** between 25°C and 60°C
84.9 *C. between 60°C and 90°C
9.4 **D.** higher than 90°C

Acceptable Standard

For question 11, students had to know that natural selection protects an insect population from changes in the environment. Almost four out of five students achieving the *acceptable standard* know this.

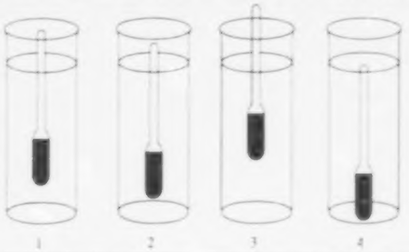
For question 37, students were required to interpret information from a graph and apply understanding of melting point of a substance. Most students can do this.

To successfully answer **numerical-response question 2,** students had to predict the effect of density on buoyant force in four sugar solutions. Nearly four out five students achieving the *acceptable standard* can do this.

For **question 18,** students had to identify the controlled variables of an experiment. Students achieving the *acceptable standard* but not the *standard of excellence* had difficulty doing this.

Use the following information to answer numerical-response question 2.

A candy maker tested four different sugar solutions by placing a hydrometer in each.



2. Arrange the four solutions in order from **lowest** density to **highest** density.

72.1 Answer: 4,2,1,3

Use the following information to answer question 18.

Mr. and Mrs. Brown decide to use curtain material that will make the house more energy efficient. They experiment to determine the best solar energy-absorbing material. They note the following variables:

I. time of day
II. type of material
III. length of time in the sunlight
IV. surface area exposed to sunlight

18. The variables that should be kept **constant** in this experiment are

5.6 **A.** I and II
11.9 **B.** II and IV
58.3 ***C.** I, III, and IV
24.2 **D.** II, III, and IV

Use the following information to answer question 53.

Jane reports to the group. She tells them that acid occurs when products of combustion of fossil fuels are released into the atmosphere, combine with moisture, and fall to the earth as acid rain or snow. The high acidity damages both water environments and human-made structures. In an effort to combat the effects of acid rain, governments have begun dumping large quantities of calcium carbonate (limestone) into lakes to reduce their acidity.

53. For an environmentalist, which would be the **most** environmentally friendly means of dealing with the problem of acid rain?

9.9 **A.** Reducing the acidity with a base
4.6 **B.** Putting acid-tolerant fish into the lakes
11.6 **C.** Adding calcium carbonate (limestone) to the lakes
73.8 ***D.** Reducing the amount of sulphur oxides released into the atmosphere

Overall, results show that the students who achieved the *acceptable standard* but not the *standard of excellence*, have an ability to

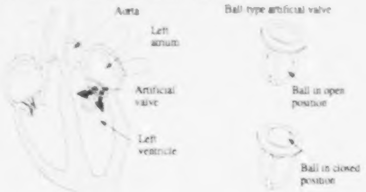
- know the effects of increased surface area
- know that natural selection protects populations (question 11)
- understand the effects of reaction rates
- interpret information from a diagram (question 37)
- know that electric currents cause magnetic fields
- predict temperature changes caused by a resistor in a circuit
- apply the principle of specific heat capacity
- identify environmentally friendly actions
- know that a bimetal strip can interrupt an electric circuit
- predict the effect of changing density on buoyant force (numerical-response 2)

Many of the these students, however, did not do as well as expected in

- defining the meaning of species
- identifying controlled variables in an experiment (question 18)
- identifying causes of reduced oxygen levels in a river
- knowing the purpose of a thermocouple
- interpreting a graph that shows an inverse relationship
- predicting the effects of changes to parallel and series circuits
- interpreting heat conduction data
- using higher level skills
- applying skills in novel situations

Use the following information to answer question 58.

During open-heart surgery, doctors often use artificial valves. If a person has a heart with a defective valve, an artificial valve can be used to replace the defective valve. This is illustrated below.



58. When the ball of the valve is in the "open" position, blood is

8.5 **A.** forced out of the left ventricle into the aorta
60.7 ***B.** supplied by the left atrium to the left ventricle
22.0 **C.** forced out of the left ventricle into the left atrium
8.7 **D.** supplied by the aorta to the left ventricle

Use the following information to answer numerical-response question 5.

A crime lab analyst used displacement to calculate the density of a piece of metal. The mass of the metal is 70.0g. When the metal was added to the beaker, the displaced water overflowed into the cylinder.

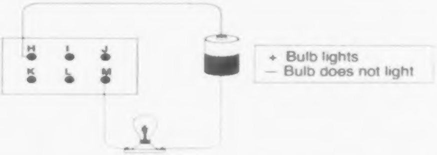
5. Calculate the density of the metal in g/cm^3. **DO NOT ROUND YOUR ANSWER.**

54.8 Answer: 1.75 g/cm^3

Use the following information to answer question 41.

Sandy finds an old rail switching circuit board that does not have a circuit diagram. When she tests this circuit board using a dry cell and bulb, she obtains the following results:

Contacts Tested	HI	H J	HK	HL	HM	I J	I K	I L	JK	KM	LM
Response of Bulb	+	—	+	—	+	—	+	—	—	+	—



+ Bulb lights
— Bulb does not light

41. The bulb will also light for connection

26.0 **A.** JM
14.5 **B.** JL
44.9 ***C.** IM
14.4 **D.** KL

Standard of Excellence

The following commentary highlights the skills and knowledge of students who achieved the *standard of excellence*.

For **question 53,** students had to identify an environmentally friendly action in response to an environmental problem. Nearly 95% of students achieving the *standard of excellence* were successful on this question.

For **question 58,** students needed to know how valves control the movement of fluids. About nine out of ten students achieving this standard know this.

Numerical-response question 5 required students to calculate the density of a metal based on measured mass and volume displacement. Nearly all of these students can do this.

Question 41 required students to predict hidden circuit connections from circuit test data. Some students achieving the *standard of excellence* had difficulty doing this.

Students who achieved the *standard of excellence* demonstrated more success than did other students when answering questions that required applying science concepts in novel or new contexts, identifying variables in experiments, and interpreting complex information or data. Specifically, students who achieved the *standard of excellence* could

- comprehend the meaning of scientific and technological terms
- infer relatedness of species
- classify organisms
- identify variables in experiments
- interpret information and data about the environment
- identify the purpose of different structures of living things
- identify problems with selective breeding
- predict the effects of temperature changes on liquid viscosity
- predict habitat of organisms
- evaluate environmental actions (question 53)
- analyze how valves control the movement of fluids (question 58)
- know the purpose of an electrical device
- interpret information about chemical and physical changes
- interpret information about heat conduction
- calculate density (numerical-response 5)

However, these students did not do as well as expected in

- interpreting information about heat conduction and radiation
- selecting a physical property that would classify materials in a group
- understanding the application of average population of organisms
- interpreting circuit diagrams and charts (question 41)
- identifying the manipulated variable on a graph
- identifying the benefit of a medical development on society
- understanding the inverse relationship between resistance and conductor diameter and/or temperature.

Performance-Based Assessment

General Description

A total of 697 randomly selected students from a sample of schools throughout the province were involved in performance-based assessment.

Performance-based assessment was developed to assess students' higher order thinking skills in real-life problem-solving situations.

The tasks assessed aspects of science that could not be measured adequately by paper-and-pencil tests in which only the answer is recorded and marked.

Students were asked to solve six real-life problems and were given concrete materials and/or information to solve these problems. These activities are described in Table 4-8.
A group of experienced Grade 9 Science teachers met in July 1993 and established scoring standards. All student responses were scored following the standards set, with about 20% of papers being rescored to ensure marker consistency. Markers used holistic scales to rate student responses for problem solving and communication.

The results are shown in Table 4-9 and figures 4-3 and 4-4.

Table 4-8
Grade 9 Science
Performance-Based Assessment Activities

Activity	Name	Topic	Program Area	Learner Expectation
1	Seed Dispersal	Diversity of Living Things	Nature of Science	Observe seeds Infer seed dispersal Predict dispersal patterns
2	Sugar Solution	Fluids and Pressure	Science and Technology	Construct and calibrate a hydrometer Use a hydrometer to measure liquid density
3	Sleeping Bags	Heat Energy	Science and Technology	Design and execute an experiment to test insulation effectiveness
4	Robot Arm	Electromagnetic Systems	Science and Technology	Design, test, troubleshoot, evaluate, and construct an electromagnet
5	Bulk Food Store	Chemical Properties	Nature of Science	Develop an experimental procedure to identify white powders
6	Hazardous Waste	Environmental Quality	Science, Technology, and Society	Analyze information Examine perspectives Identify alternatives Consider consequences

Table 4-9
Grade 9 Science
Performance-Based Assessment Results

	Student Achievement	Activity 1 (%)	Activity 2 (%)	Activity 3 (%)	Activity 4 (%)	Activity 5 (%)	Activity 6 (%)
Problem Solving	Beyond Grade 9	15.5	27.7	28.0	13.7	23.0	2.2
	At Grade 9	44.0	16.6	48.5	24.9	43.2	27.6
	Not Yet at Grade 9	29.5	30.5	19.1	27.2	25.9	64.4
	Totally Misunderstood or Left Blank	11.0	25.2	4.4	34.2	7.9	5.8
Communication	Beyond Grade 9	24.8	17.9	25.0	10.0	18.6	4.1
	At Grade 9	39.0	21.4	49.2	25.9	39.7	26.8
	Not Yet at Grade 9	24.9	26.9	20.4	30.4	31.5	63.0
	Unclear and Inappropriate	11.3	33.8	5.4	33.7	10.2	6.1

Figure 4-3
Grade 9 Science
Percentage of Students Achieving At or Beyond Grade 9 Expectation (PBA), by Activity

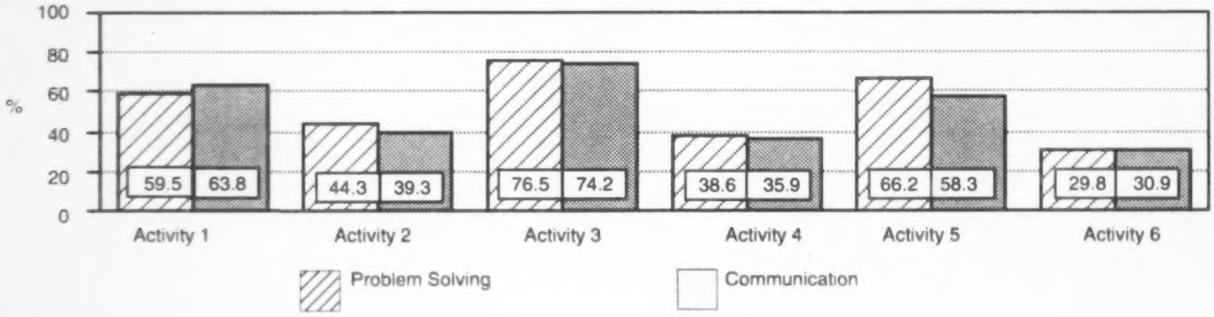
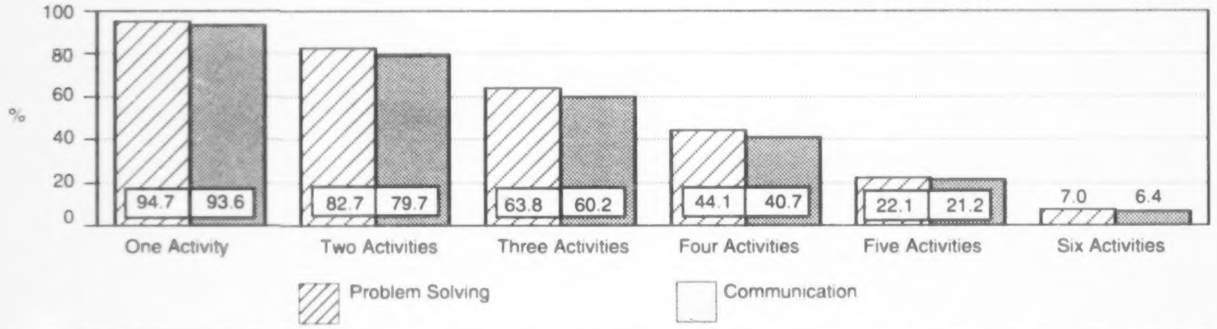


Figure 4-4
Grade 9 Science
Percentage of Students Achieving At or Beyond Grade 9 Expectation (PBA), by Number of Activities



Examiner's Observations

The results show students could

- solve problems using scientific inquiry skills
- make simple observations and inferences
- use a variety of strategies when given more materials than needed to solve a problem
- account for the manipulated variable and responding variable in an experiment
- get the correct solution if they could construct a device to solve the problem
- arrive at the correct solution if they understood the problem and implemented an appropriate strategy

The results show that students found it difficult to

- solve open-ended problems successfully
- suggest more than one alternative or perspective on an issue
- construct a device to solve a practical problem
- look at an environmental issue from different perspectives
- make detailed observations
- account for controlled variables in an experiment
- identify and communicate the relationships found in a set of data or observations
- communicate in forms other than—or in addition to—writing in sentences and paragraphs

There are gender similarities and differences in students' ability to solve problems; girls were better than boys in collecting and interpreting data and applying decision-making processes in an environmental issue. Boys were better at constructing devices to solve problems. Both were successful at applying basic inquiry skills in problem solving.

Overall, these results indicate that Grade 9 students have weak inquiry and problem-solving skills. They attained acceptable performances on only two of the six PBA activities. It is apparent that the new Grade 9 science program has not been fully implemented in Alberta schools and that many students are not receiving sufficient experiences in hands-on inquiry, hands-on problem solving, and environmental decision making.

A more detailed description of the assessment tasks and scoring criteria, and samples of students' performances are provided in the booklet *Samples of Students' Responses from the June 1993 Grade 9 Science Performance-Based Assessment Tasks.*

Relationship between Performance-Based Assessment and the Achievement Test

Generally, results show a positive correlation between achievement test scores and scores on the performance-based assessment. The highest correlations occur between the total achievement test score and each of the following performance-based activities: Seed Dispersal (0.50), Sugar Solutions (0.43), and Robot Arm (0.42). Also, positive but lower correlations occur for the other three activities: Sleeping Bags (0.27), Bulk Food Store (0.29), and Hazardous Waste (0.20). Students had greater difficulty demonstrating problem-solving skills in the performance-based assessment tasks than on the machine-scored component.

Also, other possible relationships between student results on the Grade 9 Performance-based Assessment and student performance on the Grade 9 Science Achievement Test were explored by classifying students according to their performance on the achievement test. Students were split into three groups: students achieving the *standard of excellence,* students achieving the *acceptable standard* but not the *standard of excellence,* and students not yet achieving the *acceptable standard.* Table 4-10 contains the results of this analysis.

Students achieving the *standard of excellence* on the achievement test also performed higher than other students on all performance assessment tasks. However, only 2.5% of these students attained a level of excellence for Activity 6—Hazardous Waste, the most difficult task.

Table 4-10
Grade 9 Science
Relationship Between Achievement Test Results and Performance-Based Assessment

		Achievement Test Results (Percentage)					
		Problem-Solving Component			Communications Component		
	Performance-Based Assessment Score	Standard of Excellence	Acceptable Standard	Below Acceptable Standard	Standard of Excellence	Acceptable Standard	Below Acceptable Standard
Activity One	0	4.5	8.6	29.5	4.5	7.7	30.7
	1	13.6	37.7	50.0	11.6	31.8	37.5
	2	52.5	44.5	20.5	41.9	43.2	25.0
	3	29.3	9.1	0.0	41.4	17.3	6.8
Activity Two	0	14.6	23.2	50.0	19.2	32.7	67.0
	1	20.7	37.7	37.5	24.2	32.3	21.6
	2	20.2	18.2	6.8	29.3	22.3	10.2
	3	44.4	20.9	5.7	27.3	12.7	1.1
Activity Three	0	2.0	3.2	8.0	2.5	4.5	9.1
	1	13.6	21.8	31.8	14.1	21.4	36.4
	2	48.0	51.4	40.9	45.5	56.4	38.6
	3	36.4	23.6	19.3	37.9	17.7	15.9
Activity Four	0	15.2	37.7	56.8	15.2	38.2	54.5
	1	24.2	30.5	31.8	25.3	33.2	33.0
	2	35.4	21.8	9.1	38.4	23.2	11.4
	3	25.3	10.0	2.3	21.2	5.5	1.1
Activity Five	0	3.0	9.5	11.4	3.5	11.8	18.2
	1	17.7	29.1	46.6	28.3	32.3	42.0
	2	47.5	43.2	29.5	41.4	41.8	30.7
	3	31.8	18.2	12.5	26.8	14.1	9.1
Activity Six	0	3.0	6.8	3.4	2.5	6.9	5.7
	1	59.6	64.8	86.4	53.0	66.1	87.5
	2	34.8	25.1	10.2	37.9	22.9	6.8
	3	2.5	3.2	0.0	6.6	4.1	0.0

Overall, students achieving the *acceptable standard* and not the *standard of excellence* on the achievement test found the performance-based tasks significantly more challenging than students who achieved the *standard of excellence*. They were able to respond best to the Sleeping Bags activity; however, only 28.3% achieved the *acceptable standard* on the Hazardous Waste activity. This highlights the difficulty students have addressing environmental issues from different perspectives.

Students achieving below the *acceptable standard* had a low success rate on five of the six activities. They had the greatest success on Activity 3—Sleeping Bags, where 60.2% and 54.5% of students achieved at or beyond Grade 9 expectations on problem-solving and communication skills, respectively. They had the least success with the Hazardous Waste activity, where 10.2% of these students achieved the acceptable standard for problem-solving skills.

Contexts for Learning
General Description

In June 1993, 154 Grade 9 Science teachers and 532 students from across the province participated in a study designed to examine relationships among various contexts for learning and student achievement. Students responded to questions related to the attitudes outlined in the *Program of Studies* for Science. Teachers reported on the types and frequency of use of instructional strategies, activities, classroom resources, and manipulatives. Results of this study are reported in Table 4-11 and Table 4-12.

Table 4-11
Grade 9 Science
Contexts for Learning: Percentage Distribution of Student Responses

Statement	Always	Often	Sometimes	Rarely	Never	No Comment
1. There are many ways to find an answer to a practical problem in science.	2.3	53.0	22.0	2.0	<1.0	<1.0
2. I am confident that when I am presented with a problem in science, I can usually find a way to solve it.	7.0	45.0	38.0	8.0	1.0	1.0
3. It is important to know some science in order to get a good job.	36.0	42.0	18.0	2.0	<1.0	<1.0
4. I am good at science	8.0	38.0	40.0	8.0	3.0	3.0
5. Science helps me:						
a. understand how things work	34.0	46.0	17.0	2.0	<1.0	<1.0
b. prepare for high school	38.0	35.0	19.0	5.0	<1.0	3.0
c. solve practical problems	24.0	45.0	22.0	5.0	2.0	1.0
d. make decisions(env. qual)	27.0	37.0	26.0	6.0	2.0	1.0
6. Science is useful for solving every day problems.	15.0	36.0	34.0	12.0	1.0	1.0
7. I enjoy doing science experiments	31.0	31.0	26.0	8.0	2.0	1.0
8. I like to be challenged in science	20.0	26.0	31.0	13.0	7.0	3.0
9. I feel successful in science	7.0	33.0	42.0	12.0	3.0	3.0
10. The more I learn in science, the more interesting it becomes.	24.0	38.0	25.0	7.0	3.0	2.0
11. I like to be presented with a problem in science, and then develop my own procedure to solve it.	12.0	25.0	35.0	17.0	9.0	2.0
12. I would rather watch the teacher do a lab demonstration than do the investigation myself.	6.0	9.0	23.0	29.0	31.0	1.0
13. Theories in science cannot be questioned or changed.	8.0	13.0	31.0	19.0	14.0	14.0
14. If, after solving a challenging science problem, I found that other classmates had different results, I would:						
a. assume I made a mistake and that my results are incorrect	5.0	18.0	44.0	23.0	7.0	2.0
b. assume the others made a mistake	2.0	11.0	42.0	30.0	11.0	3.0
c. want to share my results with others	22.0	38.0	24.0	8.0	4.0	3.0
15. I like to work in groups in science class.	54.0	28.0	13.0	2.0	2.0	1.0

Continued

Table 4-11 (continued)

Statement	Always	Often	Sometimes	Rarely	Never	No Comment
16. I enjoy doing science projects	24.0	35.0	27.0	9.0	2.0	2.0
17. I have used the following sources of information this year to gain information for science research reports or science projects:						
a. experts	7.0	13.0	26.0	23.0	25.0	6.0
b. references	20.0	31.0	28.0	11.0	4.0	4.0
c. community resources	4.0	13.0	25.0	28.0	22.0	6.0
18. I do science experiments at home.	2.0	3.0	22.0	33.0	36.0	3.0
19. If a conclusion is going to have merit, then the experiment can be repeated and the same results will be generated.	15.0	23.0	34.0	8.0	1.0	17.0
20. I am careful to record exactly what I observe so that my conclusions are based on the most accurate data.	30.0	42.0	21.0	3.0	1.0	1.0
21. Technological problems are solved by using the same methods or procedures each time.	8.0	20.0	39.0	19.0	5.0	8.0
22. I find it easy to work with technological equipment	20.0	32.0	31.0	10.0	3.0	3.0
23. Environmental problems can be solved with technological or scientific knowledge	15.0	47.0	28.0	3.0	2.0	6.0
24. If I have a viewpoint on an environmental issue, I will try to convince a person who has an opposite viewpoint that they are wrong.	14.0	23.0	28.0	22.0	9.0	5.0
25. When I am using a piece of new technological or scientific equipment, I study or try to find out the correct safety procedures for its use.	26.0	33.0	27.0	5.0	4.0	4.0

Table 4-12
Grade 9 Science
Contexts for Learning: Percentage Distribution of Teacher Responses

Statement	Never	Rarely	Sometimes	Often	Always	N/A
1. I used the following instructional strategies with my Science 9 students this year:						
a. Full class discussion	0.0	1.8	22.7	53.8	11.7	0.0
b. Reading from a textbook	1.2	4.3	42.4	39.5	7.6	0.0
c. Worksheets	0.0	20.6	47.6	28.8	2.9	0.0
d. Small Group discussion	1.7	22.1	49.4	24.4	2.3	0.0
e. Research	1.2	25.7	52.9	13.5	1.8	0.0
f. Oral presentations	13.5	33.9	43.9	7.6	1.6	0.0
g. Project work	1.8	18.8	54.1	22.9	2.4	0.0
h. Viewing films/video	4.7	28.5	55.2	11.0	0.6	0.0
i. Lecture and note taking	1.2	13.4	43.6	36.6	5.2	0.0
j. Lab investigations	0.0	1.7	23.3	56.4	18.6	0.0
k. Demonstrations	0.0	5.2	40.1	44.8	9.9	0.0
l. Field Trips	39.5	44.2	11.6	1.7	1.2	1.7
2. How often did your grade 9 Science class do the following kinds of writing this year?						
a. Journal entries	69.8	13.6	8.3	5.9	1.8	0.6
b. Essays	23.3	46.5	24.4	4.7	0.6	0.6
c. Summaries	2.9	20.6	42.9	29.4	3.5	0.6
d. Descriptions	2.4	11.3	49.4	31.5	4.2	1.2
e. Note taking	0.6	8.7	37.2	43.6	9.9	0.0
f. Ideas from research	5.3	23.7	50.9	17.8	2.4	0.0
g. Ideas from group/class discussion	1.7	16.3	48.8	28.5	4.7	
h. Lab write-ups	0.0	2.9	20.9	52.3	23.8	0.0
i. Reports	3.5	28.2	47.1	17.1	3.5	0.6
j. Generating questions	8.1	22.7	39.5	22.7	6.4	0.6
k. Inquiry activity write-ups	4.2	13.7	36.3	33.3	10.7	1.8
3. This year, my students have presented projects in the following formats:						
a. Written	2.3	7.0	43.3	38.0	9.4	0.0
b. Story	58.7	23.4	12.6	1.8	0.6	3.0
c. Essay	29.5	28.3	31.9	7.2	1.8	1.2
d. Display	13.1	25.2	42.3	13.7	1.8	0.0
e. Videotape	77.0	10.9	7.3	1.8	0.6	2.4
f. Newspaper article	61.1	20.4	12.0	3.0	1.2	2.4
g. Poster series	25.4	20.1	42.0	10.7	1.8	0.0

Continued

Table 4-12 (continued)

Statement	Never	Rarely	Sometimes	Often	Always	N/A
h. Audiotape	84.9	8.4	1.8	1.8	0.0	3.0
i. Scale model	44.3	21.0	26.3	4.2	1.2	3.0
j. Play	74.7	12.7	8.4	0.6	0.6	3.0
k. Slides and Commentary	83.6	9.1	4.8	0.0	0.0	2.4
l. Working model	22.8	21.6	41.9	10.8	1.2	1.8
4. I encourage a variety of formats for presenting research reports	4.7	12.9	42.1	24.0	11.7	4.7
5. I encourage students to design their own experiments	2.3	15.7	48.3	25.6	8.1	0.0
6. I demonstrated that practical problems may have a variety of viable solutions	0.0	1.8	25.1	53.2	19.9	0.0
7. How often did your students have a choice about how they would design their investigations?	2.3	22.1	55.2	14.0	5.8	0.6
8. My students participate in at least one "hands-on" activity in science each week	0.0	5.3	28.1	25.1	41.5	0.0
9. My students do at least one lab activity in science each week.	0.0	5.8	22.2	29.2	42.7	0.0
10. Through modelling and discussion, my students are encouraged to realize that a particular point of view must be supported with factual data.	0.0	3.5	26.3	39.2	31.0	0.0
11. When my students were presented with an open-ended problem where they were expected to develop their own plan, most of them appeared:						
a. Motivated	1.2	2.8	39.2	12.2	8.4	1.2
b. Bored	8.2	42.1	41.3	7.5	–	1.3
c. Frustrated	1.9	17.9	61.5	17.9	–	0.6
d. Confident	1.2	16.8	46.0	34.2	1.2	0.6
e. Insecure	8.9	31.6	44.3	15.2	–	–

Continued

Table 4-12 (continued)

Statement	Yes	No	N/A
12. Which of the following types of assessment did you use with your science students this year?			
a. Multiple choice tests	98.8	1.2	—
b. Short answer	99.4	0.6	—
c. True-false	84.9	13.4	1.7
d. Extended response	94.8	2.9	2.3
e. Performance assessment	70.3	25.0	4.7
f. Lab write up	92.7	2.3	—
g. Presentations	71.5	27.9	0.6
h. Checklists	37.2	59.9	2.9
i. Anecdotal records	35.5	62.2	2.3
j. Student self-evaluation	42.4	57.0	0.6
k. Vocabulary match	79.1	19.8	1.2
l. Interpreting diagrams etc.	99.4	0.0	0.6
m. Creating diagrams, etc. and/or modeling to show understanding	80.5	16.5	3.0
n. Problem solving	97.7	1.7	0.6
13. Were the following activities a part of the grade 9 science program this year?			
a. Field trips	36.0	62.8	1.2
b. Science fair	26.7	71.5	1.7
c. Science Olympics	19.8	78.5	1.7
d. Listening to guest speakers	37.2	61.6	1.2
e. Decision making	93.0	5.8	1.2
f. Writing assignments	95.9	3.5	0.6
g. Completing handouts	94.2	5.8	—
h. Watching demonstrations	98.8	1.2	—
i. Lab activities/experiments	100.0	—	—
j. Research projects	87.8	11.6	0.6
k. Making models	72.1	26.7	1.2
l. Participating in debates	48.8	48.8	2.3
m. Problem solving/small group	91.3	6.4	2.3
n. Problem solving w/ STS	88.4	10.5	1.2
o. Open-ended investigations	84.3	14.0	1.7
p. Analyzing photo/graph/table	98.3	1.7	—

Continued

Table 4-12 (continued)

Statement	Yes	No	N/A
q. Using a computer	22.1	75.6	2.3
r. Writing frequent quizzes	72.1	27.3	0.6
s. Working in small groups	95.3	3.5	1.2
t. Writing in a journal	17.4	80.2	2.3
u. Completing exercises	97.7	1.7	0.6
v. Generating solutions	95.9	2.3	1.7
w. Evaluating designs	80.8	19.2	—
x. Taking action toward an issue	49.4	49.4	2.3
y. Evaluating effects of action	59.3	38.4	2.3
14. This year, the following items were readily available in the science room for my students or my use in planning and instructing:			
a. Science Directions 9 TRM	97.1	1.7	1.2
b. Science Directions 9 ST	97.1	2.3	0.6
c. Sci + Tech. & Soc. TRM	45.3	52.3	2.3
d. Sc. + Tech. & Soc. ST	36.6	62.2	1.2
e. Water Lit. Prog. —AB. Env.	33.1	66.3	0.6
f. Space Age Agr. Res.	11.0	86.6	2.3
g. Energ. Lit. Series(SEEDS)	32.6	64.5	2.9
h. Aquatic Invert. Mon. Prog.	16.3	81.4	2.3
i. Tables or lab counters	91.9	7.6	0.6
j. Sinks for lab stations	87.8	11.0	1.2
k. Films/videos	85.5	13.4	1.2
l. Equipped	88.4	8.1	3.5
m. Basic Mat. for Topic 1	93.0	4.1	2.9
n. Basic Mat. for Topic 2	92.4	4.1	3.5
o. Basic Mat. for Topic 3	93.6	3.5	2.9
p. Basic Mat. for Topic 4	88.4	8.7	2.9
q. Basic Mat. for Topic 5	93.6	2.9	3.5
r. Basic Mat. for Topic 6	80.2	16.3	3.5

Student Attitude Questionnaire

The student questionnaires reveal that students generally feel that:

- it is important to know some science in order to prepare for high school and to get a good job
- science helps them understand how things work and to solve problems
- it is important to record exactly what they observe so that their conclusions are based on the most accurate data

Relationships between Student Attitudes and the Results on the Achievement Test

Students achieving the *standard of excellence* on the achievement test understand that science helps them solve problems. They indicated that science will help them get ready for high school and to get a job. This group of students reported greater curiosity about events and objects in the natural world. They were more likely to be open-minded and thought that critical thinking was important. As a group, they also enjoyed doing experiments.

Of the students achieving the *acceptable standard*, but not the *standard of excellence*, only 36.6% indicated they were often good at science. Also, only 56.1% indicated they often enjoyed doing experiments and 55% often enjoyed doing projects. However, this group of students did report a tendency to respect accuracy and precision, be critically minded and appreciate the contribution of science for solving problems. Most of these students liked to work in groups. Many of the students achieving below the *acceptable standard* indicated that learning science would help them get a job and that honesty in reporting is important. Only 23.3% of these students thought they were good at science. Also, only 58.7% of students in this group indicated they often enjoyed doing experiments in science. As a group, they showed a lower tendency to be critically minded.

Teacher Questionnaire

The teacher questionnaire reveals that teachers reported

- using a variety of instructional strategies with their Science 9 students, with full class discussions and lab investigations the most frequently mentioned strategy.
- having students do various writing, with note taking, lab write-ups, and inquiry activity write-ups the most frequently mentioned activities.
- having students do at least one investigation per week.
- demonstrating to students that practical problems can have more than one solution.
- using a variety of assessment methods.

Journal writing was not being emphasized in schools—69.8% of teachers never had students write in a journal. This is of interest, because journal writing can be used for student self-assessment.

Students tended to present their projects in written form (90.7%); however, they rarely write stories (only 15%) or essays (only 40.9%). In the future, there may be an opportunity for teachers to explore language communication in science.

Teachers used a variety of assessment types, which tend to be teacher directed. Student self-evaluation was reported to be used by only 42.4% of the teachers.

Enrichment activities were not emphasized—for example, only 36.0% of teachers reported having their classes go on field trips, and only 37.2% of teachers reported having students listen to guest speakers. Enrichment activities can provide opportunities for students to see Science, Technology, and Society connections.

Only 48.8% of teachers reported having their students participate in debates. Debates can provide an excellent opportunity for students to appreciate the different sides to a STS issue. Also, only 49.4% of teachers reported having students take action toward an STS issue.

Although there is a technology focus in the Grade 9 science program, only 22.1% of the teachers reported using computers for instruction.

Relationships between Context for Learning and the Results on the Achievement Test

Possible relationships between reported teacher behaviours and student performance on the 1993 Grade 9 Science Achievement Test were explored by classifying students according to their performance and looking for differences in the frequency of responses on the teacher survey.

Students were split into three groups: students achieving the *standard of excellence*, students achieving the *acceptable standard* but not the *standard of excellence*, and students not yet achieving the *acceptable standard*. Student achievement results for 532 students were matched with survey responses of their teachers (154 teachers).

Teaching behaviours as reported by teachers of students achieving the *standard of excellence* were compared to the responses of teachers of students who had achieved the *acceptable standard* and to the responses of teachers of students who had not yet achieved the *acceptable standard*.

For students achieving the *standard of excellence*, 93% of their teachers reported emphasizing technological problem solving and societal decision making, whereas for students achieving below the *acceptable standard* only 73.9% of their teachers indicated emphasizing these skills in their class. Also, for students achieving the *standard of excellence* 76.1% of their teachers indicated that they encouraged students to support their points of view with factual data compared to 43.4% for teachers of students who had not achieved the *acceptable standard*.

For students achieving the *standard of excellence*, their teachers reported having students write about generating questions (43.7%), write about generating ideas from discussion (50.7%), and write up inquiry activities (81.7%) more frequently than the teachers of students who had not yet achieved the *acceptable standard* (8.6%, 13.0%, and 47.8% respectively).

For students who had achieved the *standard of excellence*, their teachers indicated they placed a greater emphasis on problem solving (93.0%) than the teachers of students who had not achieved the *acceptable standard* (73.9%). Also, for students who had achieved the *standard of excellence* 52.1% of their teachers indicated a preference for having students do self-assessment compared to 39.1% of the teachers of students who had not achieved the *acceptable standard*.

Students who had achieved the *standard of excellence* had teachers who indicated a greater preference to supplement their programs with additional instructional materials than teachers of students who had not achieved the *acceptable standard*. Also, students who had achieved the *standard of excellence* had teachers who indicated a greater usage of computers (28.2%) than the teachers of students who had not achieved the *acceptable standard* (4.3%).

Section 5

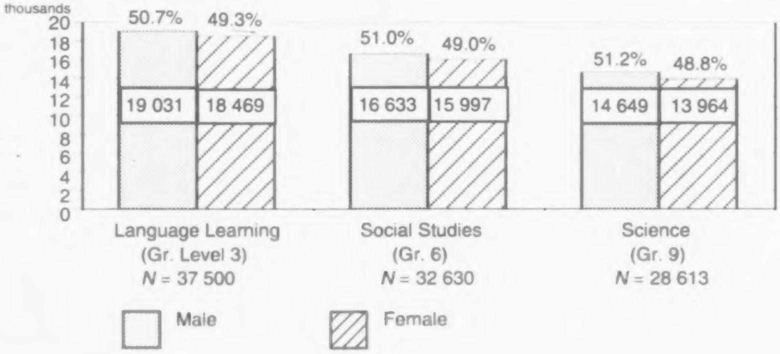
Achievement by Gender

Information on the gender of students who wrote the provincial achievement tests has been collected, analyzed, and reported since 1989.

This section of the report answers the following questions:

- What is the proportion of males and females who wrote the 1993 achievement tests?
- Is the percentage of males and females meeting standards the same in each subject?
- Are the 1993 results for individual subjects similar to or different from those of 1989 through 1992?

Figure 5-1
Number of Achievement Tests Written by Gender
June 1993



Observations and Discussion

What is the proportion of males and females who wrote the 1993 achievement tests?

Results for 1993, presented in Figure 5-1, reveal that more males than females wrote the achievement tests at each grade level. This pattern is similar to the data from 1989 through 1992, with the exception of 1990 when more females than males wrote the Grade 9 English Language Arts test.

Is the percentage of males and females meeting standards the same in each subject?

Results for 1993, presented in Figures 5-2 and 5-3, reveal that more females than males achieved the *acceptable standard* and the *standard of excellence* in Grade Level 3 Language Learning and Grade 6 Social Studies. In Grade 9 Science, however, males outperformed females, with higher percentages achieving both the *acceptable standard* and the *standard of excellence*.

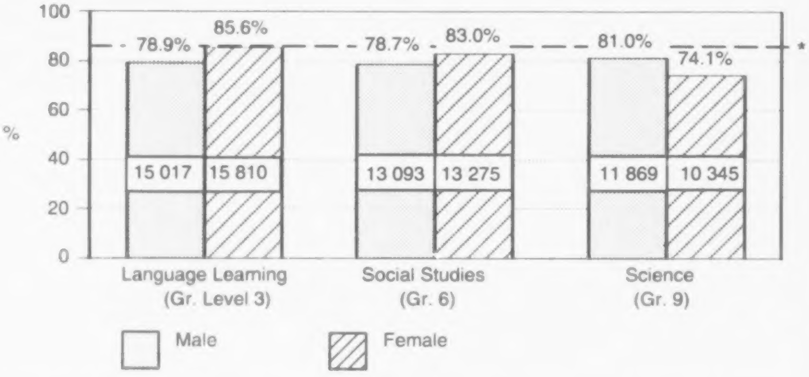
Are the 1993 results for individual subjects similar to or different from those of 1989 through 1992?

The 1993 pattern of results for Grade Level 3 Language Learning is similar to the Grade 3 results from 1989. A similar pattern was found in both the 1990 Grade 9 and 1992 Grade 6 English Language Arts results.

The pattern for the 1993 Grade 6 Social Studies results is similar to the 1989 Grade 6 and the 1992 Grade 3 Social Studies results: females outperformed males at both the *acceptable standard* and the *standard of excellence*. In 1991, however, males marginally outperformed females in Grade 9 Social Studies.

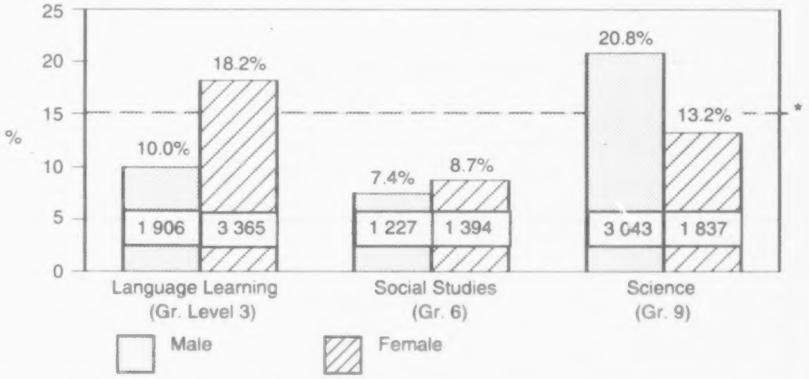
The 1993 Grade 9 Science results show a similar pattern to the 1989 Grade 9 and the 1990 Grade 6 Science results: males outperformed females, particularly at the *standard of excellence*. In 1991, however, males and females showed similar levels of achievement in Grade 3 Science.

Figure 5-2
Number and Percentage of Students Achieving Acceptable Standard on the Total Test by Gender
June 1993



* 85% of students were expected to achieve the acceptable standard on the total test.

Figure 5-3
Number and Percentage of Students Achieving Standard of Excellence on the Total Test by Gender
June 1993



*15% of students were expected to achieve the standard of excellence on the total test.

There are gender differences in the levels of achievement attained by males and females on the provincial achievement tests in the three grades and subjects tested in 1993. Since individual jurisdiction and school results may show patterns that differ from the province-wide results, school personnel are encouraged to explore gender differences within their own settings.

We welcome any comments regarding observations or thoughts on gender differences in achievement.

Section 6

Achievement by Age

Information on the age of students who wrote the provincial achievement tests has been collected, analyzed, and reported since 1990.

This section of the report answers the following questions:

- What is the age distribution of students who wrote the 1993 achievement tests?
- What relationship, if any, does age have with achievement as measured by the 1993 provincial achievement tests?

Age Groups

When achievement tests were written in June 1993, students' ages in both years and months were collected. Based on this information, each student was categorized as being in the first or the last half of his or her age year

Table 6-1
Number of Achievement Tests Written by Age*
June 1993

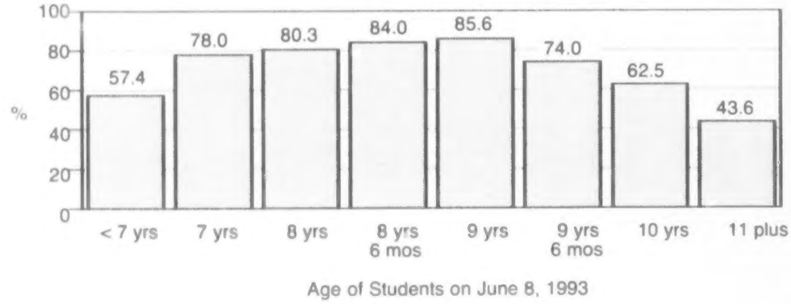
Age (6 month intervals)	Grade Level 3 Language Learning		Grade 6 Social Studies		Grade 9 Science	
	Number	Percentage	Number	Percentage	Number	Percentage
Under 7	47	0.1				
7 (84-89 mos.)	21	0.1				
7.5 (90-95 mos.)	266	0.7	1	0.0		
8 (96-101 mos.)	1 678	4.5				
8.5 (102-107 mos.)	14 240	38.0				
9 (108-113 mos.)	15 417	41.1				
9.5 (114-119 mos.)	3 846	10.3	1	0.0	1	0.0
10 (120-125 mos.)	1 513	4.0	5	0.0	1	0.0
10.5 (126-131 mos.)	182	0.5	95	0.3		
11 (132-137 mos.)	57	0.2	1 533	4.7		
11.5 (138-143 mos.)	25	0.1	11 738	36.0	1	0.0
12 (144-149 mos.)	13	0.0	12 986	39.8		
12.5 (150-155 mos.)	5	0.0	3 900	12.0		
13 (156-161 mos.)	8	0.0	1 779	5.5	3	0.0
13.5 (162-167 mos.)	3	0.0	273	0.8	94	0.3
14 (168-173 mos.)	6	0.0	60	0.2	1 599	5.6
14.5 (174-179 mos.)			12	0.0	10 500	36.7
15 (180-185 mos.)			5	0.0	11 023	38.5
15.5(186-191 mos.)			3	0.0	3 263	11.4
16 (192-197 mos.)					1 650	5.8
16.5(198-203 mos.)					267	0.9
17 or older					94	0.3
unknown	173	0.5	239	0.7	117	0.4
Total	37 500	100.0	32 630	100.0	28 613	100.0

*Age on the test day (June 8, 1993)
An empty area indicates that there were no students

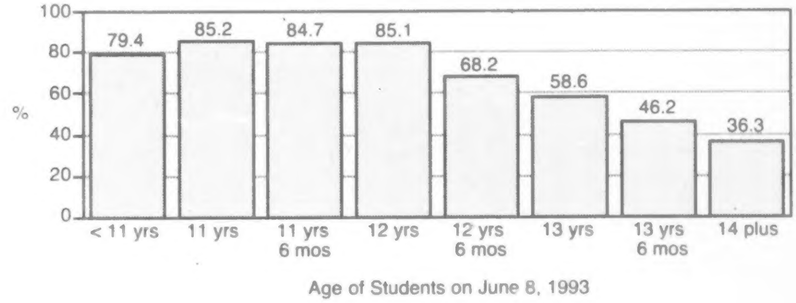
(e.g., 7 years = 84 to 89 months, 7.5 years = 90 to 95 months). Table 6-1 indicates the number and percentage of achievement tests written by age group and shows the exact range, in months, used to determine these data. Figure 6-1 and Figure 6-2 show the proportion of students in each age group who achieved standards in each grade.

Figure 6-1
Percentage of Students Achieving Acceptable Standard on the Total Test by Age
June 1993

Grade Level 3 Language Learning



Grade 6 Social Studies



Grade 9 Science

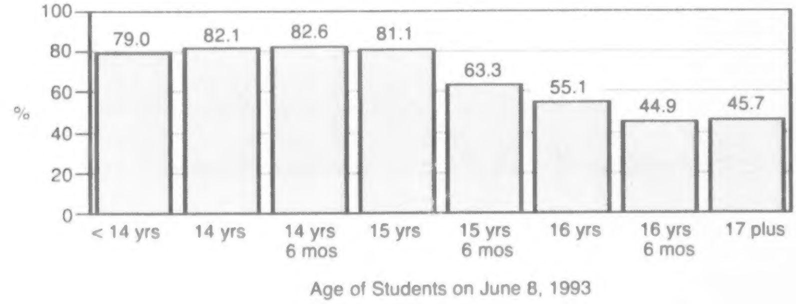
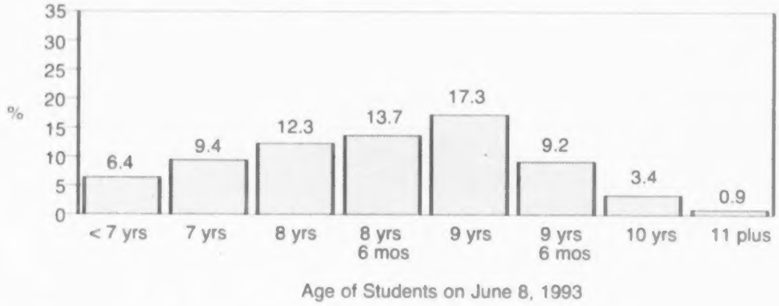
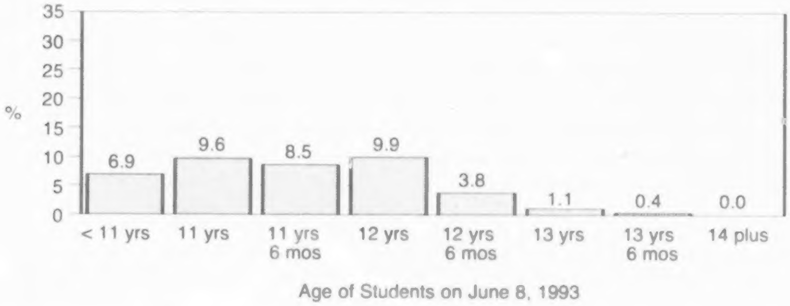


Figure 6-2
Percentage of Students Achieving Standard of Excellence on the Total Test by Age
June 1993

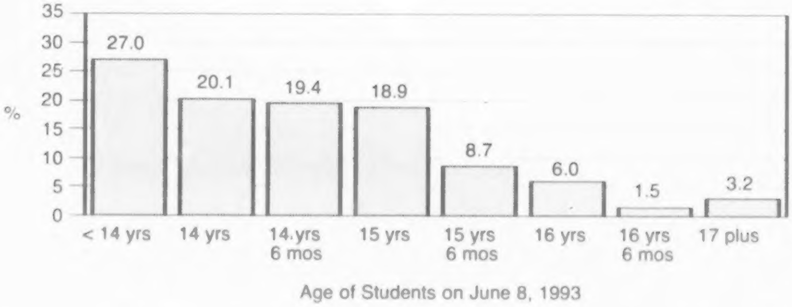
Grade Level 3 Language Learning



Grade 6 Social Studies



Grade 9 Science



Observations and Discussion

What is the age distribution of students who wrote the 1993 achievement tests?

Of the Grade Level 3 students tested in 1993, 42.5% were 8 years olds and 51.4% were 9 years old at the time of testing. Almost 5% of the students tested were 10 years old or more. Thirty-five of these students were aged 12, 13 or 14. Sixty-eight students were reported to be 7 years old or younger.

In 1993, 40.7% of tested Grade 6 students were 11 years old at the time of testing and 51.8% were 12 years old. Of the tested students, fewer than 1% were younger than 11 years old and 6.5% were older than 12 at the time of writing. Eighty students who wrote the Grade 6 test were 14 or 15 years old on that day.

For the year 1993, 42.3% of tested Grade 9 students were 14 years old on June 8 and 49.9% were 15 years old. Of the students tested, 0.3% were younger than 14 years old on the day of testing and 7% were older than 15. Ninety-four students were 17 years or older on the day of testing.

While the number of students writing the Grade Level 3 test who were reported to be 7 years old and younger was relatively small, this figure may, nevertheless, be spuriously high due to reporting error. Caution, therefore, is advised when making inferences about participation rates and levels of achievement for students in this age range.

What relationship, if any, does age have with achievement as measured by the 1993 provincial achievement tests?

In Grade Level 3, proportionally fewer students who were older than 9.5 years achieved the *acceptable standard* or the *standard of excellence*.

On the Grade 6 test, proportionately fewer students aged 12.5 years and older achieved the *acceptable standard* and the *standard of excellence*.

For Grade 9, there is an overall negative relationship between age and student achievement. Younger students generally achieve higher than do older students with regard to both the *acceptable standard* and the *standard of excellence*.

These data indicate that, in general, students who are older than the median age for their grade did not achieve as well as did younger students who wrote the test. There is a considerable drop in the proportion of students meeting standards among those whose age is at the upper range of the mainstream and beyond.

Section 7

Achievement by Grade Level

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This section answers the following question:

What percentage of grades 3, 6, and 9 Alberta students
- may be achieving beyond grade level
- are achieving at grade level
- are not yet achieving at grade level

as measured by the June 1993 achievement tests?

Within each curriculum, specific outcomes, expressed as the knowledge, skills, and attitudes to be acquired and developed, are arranged into sequences reflecting the developmental nature of learning and expectations for a learner's increasing competence in the subject area.

The 1993 achievement tests were designed to measure student achievement within the given grade level. However, a number of questions on the achievement tests could be considered to measure more advanced levels of performance. For reporting purposes, we have classified students within the grade levels framework based on the following three definitions:

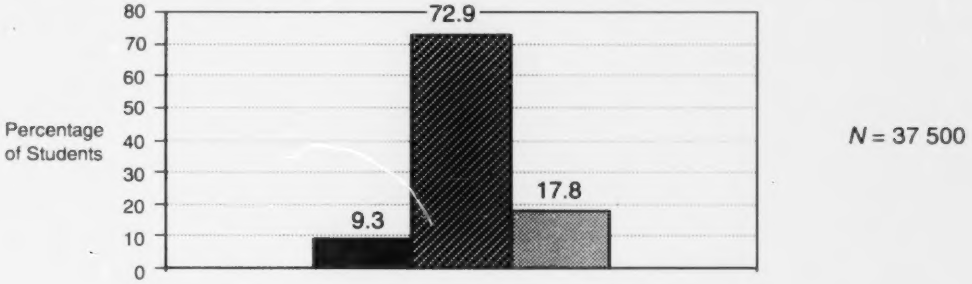
1. **May Be Achieving Beyond Grade Level**
   Students who may be achieving beyond grade level are those students who achieved the *standard of excellence* for both major components of the test.
2. **Achieving At Grade Level**
   Students who are achieving at grade level are those students who achieved the *acceptable standard* on the total test and those students who achieved the *standard of excellence* on the total test but not on both components.
3. **Not Yet Achieving At Grade Level**
   Students who are not yet achieving at grade level are those students who did not achieve the *acceptable standard* on the total test.

This classification is a different way of viewing the results from the achievement test, which means that the numbers reported differ from those indicated for percentage of students achieving standards.

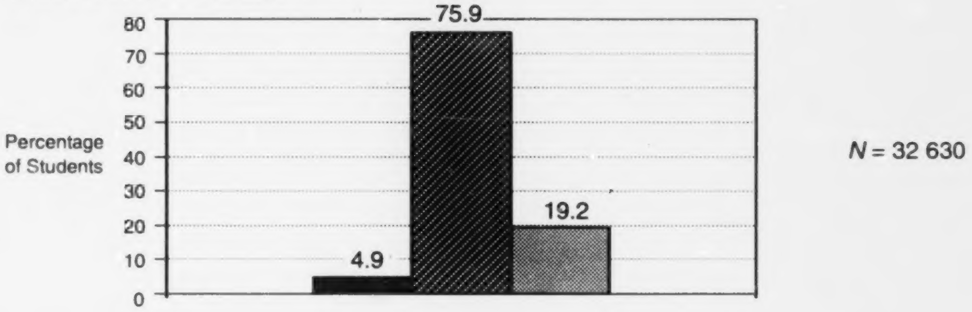
Results from the 1993 achievement tests showing distributions of grade level achievement are presented in Figure 7-1. This analysis shows the wide range of student achievement within a nominal grade level.

Figure 7-1
Distribution of Grade Level Achievement
June 1993

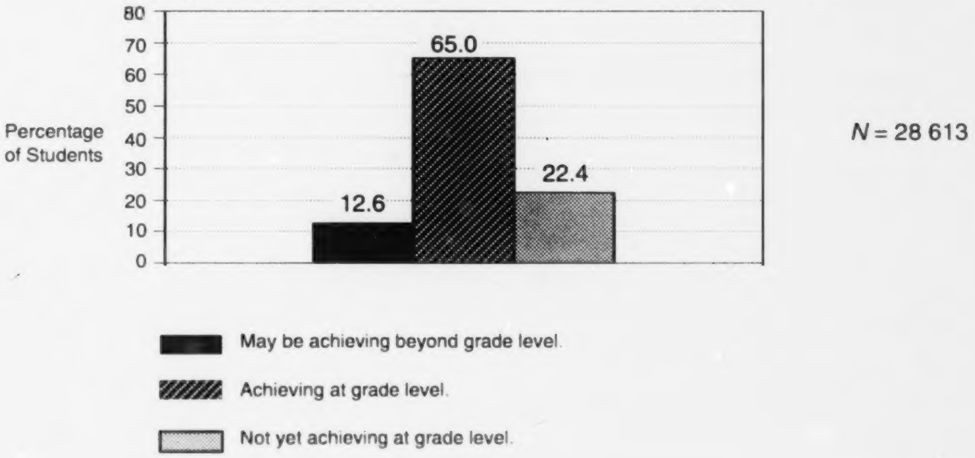
Grade Level 3 Language Learning



Grade 6 Social Studies



Grade 9 Science



Section 8

Achievement Over Time

An important task of Alberta Education is to measure and report changes in student achievement over time. Since 1983, the Student Evaluation Branch has been measuring the achievement of students in grades 3, 6, and 9 in the subject areas of language arts, mathematics, science, and social studies. The administration of the Achievement Testing Program follows a four-year cycle for each subject within each grade level. In 1985, 1989, and 1993, students in Grade Level 3 Language Learning, Grade 6 Social Studies and Grade 9 Science were tested.

This section of the report answers the following question:

- Has achievement, as measured by individual provincial achievement tests, changed since 1985 and 1989?

Two studies were carried out. The first was designed to compare achievement since 1985 on the multiple-choice questions in Grade Level 3 Language Learning, Grade 6 Social Studies, and Grade 9 Science. The second study was designed to compare achievement since 1985 and 1989 on the written-response part of the Grade Level 3 Language Learning test and the Grade 6 Social Studies test.

Descriptions of the designs and results of these special studies follow.

Multiple-Choice Study
Design and Methodology

A random sample of students was selected, by school, in each of grades 3, 6, and 9, to participate in the achievement-over-time study. In each grade, the achievement-over-time (AOT) sample was divided into three sub-groups. At each grade level, one sub-group, referred to as the AOT93 group, wrote the regular 1993 achievement test. Students in the remaining sub-groups wrote one or the other of two AOT test forms that were specifically designed for this study. These clusters of students are referred to as the AOT89 group or the AOT85 group, depending on which AOT test form they wrote.

Sampling of the schools involved in the study was carried out independently in grades 3, 6, and 9. Only schools having 18 or more students in regular English programs in 1992, in the grade being sampled, were included in the groups from which samples were drawn. The sample sizes were targeted for approximately 3 000 students at each grade level. Since the sampling was carried out independently at each grade level, some schools were randomly selected to participate at more than one grade. Students within each class were randomly assigned, by the Student Evaluation Branch, to write either the AOT93, the AOT89, or the AOT85 test form.

In each grade, the 1989 and 1985 AOT test forms included questions taken from the 1993 achievement test for that grade and portions of the original achievement test from 1989 or 1985. Table 8-1 shows the composition of these, and the 1993 AOT test form, for each grade.

Table 8-1
Design of the Achievement-Over-Time Tests
Number of Questions from Previous and Current Tests

	1993 AOT Test	1989 AOT Test	1985 AOT Test
Grade Level 3 Language Learning			
Number of 1985 Questions	0	0	21
Number of 1989 Questions	0	21	0
Number of 1993 Questions	40	19	19
Grade 6 Social Studies			
Number of 1985 Questions	0	0	28
Number of 1989 Questions	0	30	0
Number of 1993 Questions*	47	20	22
Grade 9 Science			
Number of 1985 Questions	0	0	23
Number of 1989 Questions	0	20	0
Number of 1993 Questions	65	45	42

*Three questions on the 1993 Grade 6 Social Studies Achievement Test were dropped. These questions were dropped from the AOT93 form and did not appear on either AOT89 or AOT85.

The 1989 items on the AOT89 form were used to compare 1993 student performance to student performance on these items in 1989. The 1985 items on the AOT85 form performed a parallel function. Before these comparisons were undertaken, however, it was necessary to verify that the students selected to participate in the special study were representative of students throughout the province. This was achieved by comparing AOT student performance on the 1993 items with provincial performance on the same items. The 1993 items on the AOT forms also allowed for the calculation of a 1993 test score for each of the students in the AOT study.

Experience has shown that schools participating in the AOT study, like most other schools, prepare their students to write achievement tests by administering earlier versions of those tests as practice. Questions from these earlier versions are the same ones used in the AOT study. Thus, scores for AOT students could be spuriously high due to the effects of practice. To check this possibility, a questionnaire was sent to teachers of the AOT groups to elicit information about student preparation practices. Based on teacher responses to the practice effects questionnaire, AOT students were divided into "practice" and "no practice" groups depending on whether or not they were reported to have used either 1989 or 1985 tests in preparation for writing the 1993 achievement test. Group performance on the 1993 items was compared to determine if the "practice" and "no practice" groups were of equal ability. Their performance on the 1989 (or 1985) items was then compared to determine if there were differences that could be attributed to the effects of practice.

Following the check for representativeness and the effects of practice, we were able to proceed with the performance comparisons of 1993 AOT students and students from 1989 and 1985. When making these comparisons, student results from 1989 and 1985 were excluded from the analysis if those students were from schools that were smaller than the smallest school taking part in the 1993 AOT study.

All comparisons made in this study (i.e., to check for representativeness and the effects of practice, and to make judgements about achievement over time) were assessed using statistical tests of significance. Because these tests are very sensitive when used with large samples, as was the case in this study, only differences having a probability less than 0.01 were considered to be significant.

Results

Table 8-2 presents a comparison of AOT sub-group results and 1993 provincial results. The purpose of this comparison was to verify that the students selected to participate in the special study were representative of students throughout the province.

Table 8-2
*Comparison of AOT Sub-group Results with 1993 Provincial Results**

	AOT 93 1993 Items	Province 1993 Items	AOT 89 1993 Items	Province 1993 Items	AOT 85 1993 Items	Province 1993 Items
Grade Level 3 Language Learning						
Number of 1993 Questions	40	40	19	19	19	19
Raw Score Mean	26.3	26.8	13.4**	13.0	13.3	13.2
Standard Deviation	7.9	7.9	3.8	3.9	4.1	4.0
Number of Students	959	33 546	935	33 546	938	33 546
Grade 6 Social Studies						
Number of 1993 Questions	47	47	20	20	22	22
Raw Score Mean	29.8	29.9	12.3	12.3	12.8	13.0
Standard Deviation	7.2	7.3	3.2	3.3	3.8	3.8
Number of Students	938	28 987	932	28 987	935	28 987
Grade 9 Science						
Number of 1993 Questions	65	65	45	45	42	42
Raw Score Mean	40.4	41.2	27.7**	28.7	25.8**	26.5
Standard Deviation	10.6	10.4	7.6	7.4	7.3	7.1
Number of Students	986	25 178	977	25 178	972	25 178

*Students from schools smaller than the smallest school taking part in the AOT study are excluded from this analysis. Provincial data in this table, therefore, differ from those reported elsewhere in this report.

**On these items, the mean of the AOT group is significantly different from the provincial mean.

The data indicate that there were no significant differences between provincial means and the means of the Grade 6 Social Studies AOT89 and AOT85 groups, or between provincial means and the Grade Level 3 Language Learning AOT85 means. There were, however, significant differences between the provincial mean and the AOT89 group in Grade 3. As well, in Grade 9, both the AOT89 and the AOT85 group means differed significantly from the provincial means on the same grouping of items. This indicates that the Grade 6 Social Studies sample and the Grade 3 AOT85 sample were representative of the province. However, the Grade 3 1989 AOT group and the Grade 9 1989 and 1985 AOT groups were not. To address this issue of non-representativeness, test equating procedures were used when comparing 1993 Grade 3 performance with that in 1989 and when comparing 1993 Grade 9 performance with that from 1989 and 1985.

The AOT comparison data is provided in Table 8-3. Included in this table, for each grade, is the number of questions on which comparisons were based, the mean and standard deviation for each year of comparison, and the number of students in each comparison group. It should be noted that equated means are reported for the Grade 3 1989 AOT group and the Grade 9 1989 and 1985 AOT groups.

Table 8-3
*Achievement-Over-Time Comparison of Descriptive Statistics**

	AOT 89 Group (Wrote in 1993)	1989 Province (Wrote in 1989)	AOT 85 Group (Wrote in 1993)	1985 Province (Wrote in 1985)
Grade Level 3 Language Learning				
Number of Questions	21	21	21	21
Raw Score Mean	16.1**	15.3	15.3**	14.6
Standard Deviation	4.4	4.5	4.0	3.7
Number of Students	935	31 014	938	30 976
Grade 6 Social Studies				
Number of Questions	30	30	28	28
Raw Score Mean	20.2**	19.4	18.2**	17.2
Standard Deviation	6.0	5.8	4.6	4.8
Number of Students	932	29 554	935	28 793
Grade 9 Science				
Number of Questions	20	20	23	23
Raw Score Mean	13.3	13.6	13.6**	14.0
Standard Deviation	4.0	3.8	4.1	4.2
Number of Students	977	27 041	972	29 513

* Students from schools smaller than the smallest school taking part in the AOT study are excluded from this analysis. Provincial data from 1989 and 1985 differ, therefore, from those reported in earlier reports.

** On these items, the mean of the AOT group is significantly different from the provincial mean.

The data indicate that 1993 students in Grade Level 3 and Grade 6 achieved significantly higher scores than did their cohorts from earlier years. In Grade 9 the trends were reversed, with the students from earlier years achieving the higher scores.

Inferences about these differences should be drawn with caution, as the results of the practice-effects portion of the study indicate that some of the 1993 scores may be spuriously high due to the effect of students having prepared for the test using items from the 1989 and 1985 achievement tests. In particular, there is some evidence to suggest that the Grade 3 AOT85 and the Grade 6 AOT89 groups may have benefited from such practice. Consequently, it seems reasonable to infer that some, albeit not all, of the score increases in grades 3 and 6 are due to the effects of practice.

The 1993 decline in Grade 9 scores, relative to those from 1989 and 1985, does not seem to have been mitigated by the effects of practice: few Grade 9 AOT students were reported to have used previous tests in preparation for the achievement test, and those who did practice did not achieve higher scores.

In conclusion, the data from the multiple-choice study indicate that achievement in Grade Level 3 Language Learning and Grade 6 Social Studies is somewhat higher than that in earlier years. Science achievement in Grade 9 does not seem to have fared as well, however, with 1993 students scoring about the same as students in 1989, but lower than those in 1985.

Written-Response Study Grade Level 3 Language Learning
Design and Methodology

Students' writing performance has been of particular interest to educators and to the public since the beginning of the Achievement Testing Program. Because of this interest, a study was initiated to compare 1993 writing with 1989 writing and 1985 writing in Grade Level 3 Language Learning. This was a descriptive study that required teacher-readers to take a research or reader-as-observer look at the papers they read, rather than the usual evaluative or reader-as-assessor view of a teacher-marker. No attempt was made to rescore papers; rather, teacher-readers described features of the 1993, 1989, and 1985 writing in the three scoring categories:

- Content and Development
  - –relationship between events, actions, and/or ideas and the context established by the writer
  - –beginning
  - –specificity of detail
  - –connections and/or relationships between events, actions, details, and or characters
  - –ending
  - –reader-writer relationship

- Use of Language
  - –degree to which standard sentence constructions are present and controlled
  - –presence of different sentence patterns and length
  - –quality of words and expressions

- Conventions
  - –end punctuation and capitalization
  - –spelling
  - –clarity

Comparisons were made at two standards: *Clearly Meets the Acceptable Standard* (formerly *Acceptable*—3), which represents work at an acceptable level for students completing Grade 3, and *Clearly Meets the Standard of Excellence* (formerly *Excellent*—5), which represents outstanding work for students completing Grade 3.

Papers read in the study were selected at random from papers that received scores of *Clearly Meets the Acceptable Standard* or *Clearly Meets Standard of Excellence* on the June 1993, June 1989, and June 1985 achievement tests.

A group of experienced teacher-readers, representing all major regions of the province and a variety of school settings, reviewed the selected papers.

Working alone, then in pairs, and then discussing the papers as a group, the teacher-readers described the papers for features of *content and development, use of language,* and *conventions.*

They then compared their descriptions of 1993, 1989, 1985 *Clearly Meets the Acceptable Standard* (3) and *Clearly Beyond Standard of Excellence* (5) papers to draw conclusions.

Results

Clearly Meets the Acceptable Standard (3)

Teacher-readers felt that papers judged to *Clearly Meet the Acceptable Standard* (3) in 1993 were not significantly different from 1985 *Acceptable* (3). Although they thought that 1989 *Acceptable* (3) papers were in the range of the 1993 papers *Clearly Meeting the Acceptable Standard*, they found both the 1993 and the 1985 papers to be generally superior to the 1989 papers, particularly in content and development. Teacher-reader comments on key features of these papers are summarized below.

Clearly Meets the Acceptable Standard (3) in Grade Level 3 Language Learning

Key Features of 1993 Papers	Key Features of 1989 Papers	Key Features of 1985 Papers
Content and Development	**Content and Development**	**Content and Development**
•events, actions, and/or ideas appropriate for context	•only some events, actions, and/or ideas are appropriate for context	•events actions, and/or ideas are appropriate for context
•clear idea of storyline development	•disjointed storylines	•sequential development; simple recounting of events
•strong beginnings	•confusing beginnings	•appropriate beginnings
•middle consists of actions, (events), characters not directly related	•events were rambling and connections to other events or characters were not evident	•middle consists of actions, (events), characters not directly related

•weak or missing transitions were common in all three years
•appropriate but abrupt closures were common in all three years

Use of Language	**Use of Language**	**Use of Language**
•standard sentence constructions present	•standard sentence constructions not usually present	•standard sentence constructions present
•variety of sentence length and type	•simple sentences predominate	•some variety of sentence length and type
•specific words attempted	•few vocabulary risks	•few vocabulary risks

•simple subordination or coordination using (and/or) common in all three years

Conventions	**Conventions**	**Conventions**
•somewhat controlled (many run-on sentences	•somewhat controlled	•very controlled, confidently used
•end punctuation: periods or exclamation marks	•end punctuation: periods	•end punctuation: periods
•quotation marks attempted	•quotation marks generally not attempted	•quotation marks generally not attempted
•spelling errors common; errors relatively phonetic	•few spelling errors	•few spelling errors

Excellence (5)
Teacher-readers felt that papers judged to be clearly beyond the *Standard of Excellence* (5) in 1993 were superior to the papers from 1989 and 1985, which were, nonetheless, high quality but more similar to each other. A summary of the teacher-reader comments on differences and similarities in the three reporting categories follows.

Clearly Beyond the Standard of Excellence (5) in Grade Level 3 Language Learning

Key Features of 1993 Papers	Key Features of 1989 Papers	Key Features of 1985 Papers
Content and Development	**Content and Development**	**Content and Development**
•events, actions, and/or ideas consistently appropriate	•appropriate ideas and details used to develop storylines	•appropriate ideas and details used to develop storylines
•beginning captures reader's attention; provides direction for writing	•strong beginning	•strong beginning
•specific, effective details consistently used	•specific details used	•specific details used
•connections/relationships between events, actions, details and/or characters consistently maintained	•events and details were arranged in a purposeful, effective order	•events and details were arranged in a purposeful, effective order
•clearly wrote for an audience	•audience not clear	•audience not clear
•strong, connected endings	•abrupt and/or contrived endings	•abrupt and/or contrived endings
•writer's voice was strong	•writer's voice not evident	•writer's voice not evident
•students in all three years captured reader interest by writing with imagination and creativity		
Use of Language	**Use of Language**	**Use of Language**
•presentation consistently controlled	•presentation usually controlled	•presentation usually controlled
•good variety of sentence type and length	•some variety of sentence type and length	•some variety of sentence type and length
•words and expressions timely and consistently precise and effective	•specific or descriptive verbs tended to be well used	•specific or descriptive adjectives and verbs tended to be used well
•willingness to take vocabulary risks with good results	•willingness to take vocabulary risks, but these were not always successful	•few vocabulary risks taken
Conventions	**Conventions**	**Conventions**
•punctuation controlled in all three years •few spelling errors in all three years		

Concluding Comments

The question that guided this study was: **Has writing by Grade Level 3 Language Learning students improved from 1985 to 1993?** Teachers participating in the study thought that in 1993 students *clearly meeting the acceptable standard* (3) produced writing of similar quality when compared to their 1985 and 1989 counterparts. However, in 1993 students, whose work was clearly beyond the *standard of excellence*, produced higher calibre writing when compared to their 1985 and 1989 counterparts.

Teacher-readers made the following observations related to the changing nature of the writing over the three test years.

The different prompts used on the three tests may have influenced the type of writing produced by students. Teacher-readers felt that the 1985 prompt tended to be narrow in focus and did not allow the students enough leeway to express themselves. The prompt in 1989 was perhaps more open-ended, but much of the students' interpretation hinged upon their understanding of the word "fragile", which figured prominently on a large packing box that fell from a fast-moving truck.

The teacher-readers all agreed that the 1993 "hats" prompt gave students the most latitude to develop their stories and that the picture of different hats, which accompanied the prompt, gave them possibilities from which to springboard their ideas.

All believed that the 10 minutes of collaboration time given in 1993 before writing commenced made a difference to the students, if not directly in their writing, at least in their comfort level. The fact that students were told to choose the format—story, letter, or series of diary/journal entries—that would allow them to do their best writing was also a positive change in the teachers' view.

It was very obvious to the teachers that the students writing in 1993 come from print-rich classroom environments where literature plays a key role. This strong literature-base was very evident in the writing that these students produced.

While not in the realm of assessment, teachers also noted that penmanship quality has deteriorated over the three test years. As well, in the writing from all three years, both themes and supporting details strongly reflected the popular media influences of the time. Storylines and incidents from popular television shows, movies, cartoons, and even commercials were often interwoven in the students' writing.

Written-Response Study Grade 6 Social Studies

Design

Students' writing performance has been of particular interest to educators and to the public since the beginning of the Achievement Testing Program. As a consequence of this interest in how well students write, a study was initiated to compare 1993 writing with 1989 writing and 1985 writing in Grade 6 Social Studies. This was a descriptive study that required the teacher-readers to take a research or reader-as-observer stance toward the papers they read. Teacher-readers described features of the 1993, 1989, and 1985 writing in two scoring categories:

State and Support an Opinion/Position
- Evidence of position
- Reasons/arguments used to support the position taken
- Quality of examples to support the position taken

Quality of Language and Expression
- Organization
  - –focus
  - –coherent order
  - –connections between main ideas and/or detail
- Vocabulary and Conventions
  - –effective words and expressions
  - –correct grammar, punctuation, spelling, capitalization, sentence structure
  - –effective communication

In 1985 and 1989, the written-response assignment involved short answers and one extended response. In 1993, the assignment was limited to one extended response. In order to facilitate comparison of similar assignments, only the extended response from 1985 and 1989 was compared with the 1993 assignment.

Comparisons were made at two standards: *Acceptable* (3), which represents work at an acceptable level for students completing Grade 6, and *Excellent* (5), which represents outstanding work for students completing Grade 6.

Methodology

Papers read in the study were selected at random from papers that received scores of *Acceptable* (3) or *Excellent* (5) on the June 1993, June 1989, and June 1985 achievement tests.

A group of ten experienced teacher-readers, representing all major regions of the province and a variety of school settings, reviewed the selected papers.

Working alone and in pairs, and then discussing papers as a group, the teacher-readers described the papers for features of *state and support an opinion/position* and *quality of language and expression.*

They then compared their descriptions of 1993, 1989, and 1985 *Acceptable* (3) and *Excellent* (5) papers to draw conclusions.

Results

Acceptable Standard (3)

Teacher-readers felt that the papers judged to achieve the *Acceptable Standard* (3) were slightly better in 1993 than in 1989 and 1985. Teacher-reader comments of these papers are summarized below.

Acceptable Standard (3) in Grade 6 Social Studies

Key Features of 1993 Papers	Key Features of 1989 Papers	Key Features of 1985 Papers
State and Support an Opinion/Position	**Persuasiveness and Logic of Supporting Arguments**	**Persuasiveness and Logic of Supporting Arguments**
•identifiable position presented	•identifiable position presented	•identifiable position presented
		•mechanical argumentation
•ideas presented but not developed	•ideas presented but not developed	•ideas presented but not developed
•use of implicit rather than explicit ideas	•use of implicit rather than explicit ideas	•use of implicit rather than explicit ideas
•limited defence of position, supported by generalities	•limited defence of position, supported by generalities	•limited defence of position, supported by generalities (not always accurate)
•position supported by personal experiences	•position supported by personal experiences	•position supported by personal experiences (sometimes presented as fact)
•some opinions reflect extremes found in media today		
•limited development, use, and understanding of social studies concepts	•limited development, use, and understanding of social studies concepts	•limited development, use, and understanding of social studies concepts
•limited understanding of levels of government		
Quality of Language and Expression	**Quality of Language and Expression**	**Quality of Language and Expression**
•paragraphing skills evident, use of closing paragraph	•poor organization and structure	•poor organization and structure
•frequent errors in grammar, punctuation, spelling, and sentence structure	•frequent errors in grammar, punctuation, spelling, and sentence structure	•frequent errors in grammar, punctuation, spelling, and sentence structure
•language general not specific	•language general not specific	•language general not specific
•specific words attempted	•limited vocabulary	•limited vocabulary

Excellent Standard (5)

Teacher-readers felt that papers judged to achieve the *Excellent Standard of Excellence* (5) were superior to papers from 1989 and 1985. A summary of the teacher-reader comments on differences and similarities in the two reporting categories follows.

Excellent Standard (5) in Grade 6 Social Studies

Key Features of 1993 Papers	Key Features of 1989 Papers	Key Features of 1985 Papers
State and Support an Opinion/Position	**Persuasiveness and Logic of Supporting Arguments**	**Persuasiveness and Logic of Supporting Arguments**
•strong, clear position is taken	•clearly identifiable position taken	•identifiable position presented
•position supported by one or more ideas	•position supported by one or more relevant ideas	•position supported by one or more arguments (personal experiences)
•convincing arguments well developed	•sound arguments developed	•arguments not fully developed
•consistent position throughout	•arguments lack consistency	•arguments lack consistency
•logical sequence to arguments that are based on cause/effect relationships	•supportive examples are specific and relevant	•examples very specific
•solid understanding of social studies concepts demonstrated throughout	•social studies concepts used	•limited inclusion of social studies concepts
•good understanding of levels of government		
Quality of Language and Expression	**Quality of Language and Expression**	**Quality of Language and Expression**
•writing fluent and well organized paragraphs containing a main idea and supporting facts	•writing generally fluent and good paragraph development	•logical organization but weak or missing conclusion
•few minor errors in conventions	•some minor errors in grammar, punctuation, spelling, and sentence structure	•limited number of errors in grammar, punctuation, spelling, and sentence structure
•vocabulary is accurate and effective	•language is appropriate and specific	•language is general not specific

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Concluding Comments

The question that guided this study was: **Has writing by Grade 6 Social Studies students improved from 1985 to 1993?** Teachers participating in the study thought that, in 1993, students achieving the *acceptable standard* (3) produced writing of similar quality when compared to their 1985 and 1989 counterparts. They thought that 1993 students achieving the *excellent standard* produced higher calibre writing when compared to their 1985 and 1989 counterparts.

A major change was made to the writing component of the 1993 achievement test. In 1993, students addressed only one written-response question, whereas in 1985 students answered four short written-response questions before attempting the extended response, and in 1989 students answered six short written-response questions before attempting the extended response. In addition, students in 1993 had more time to answer the extended-response question. Within the confines of a test situation, some students in 1985 and 1989 may have experienced oversaturation with the test as well as lack of time before attempting the extended response. Teacher-readers made the following observations related to the changing nature of the writing over the three test years.

The teacher-readers felt that the 1993 issue was more general and abstract than the 1985 and 1989 issues for the written-response question. They felt that while the additional time students had to do the writing assignment produced better writing than in 1985 and 1989, a more specific and concrete question might have provided students a better opportunity to achieve higher levels.

The teacher-readers thought that the different prompts used on the three tests may have influenced the type of writing produced by students. In 1985 and 1989, the short-answer questions were prompts in themselves. The 1993 prompt was more detailed than the others and included visuals. However, the teacher-readers indicated that the writing prompt may have been misleading and confusing for students not achieving provincial standards. It may have been difficult for some students to relate the information provided in the prompt to the assignment, and it may have served as a distraction rather than as a help to students in their writing. The teacher-readers felt that this may be true especially for students marginally achieving at the *acceptable standard* or lower. They felt that higher achieving students were better able to use the prompt.

In addition, the teacher-readers thought that the 1993 assignment limited student choice, as the information stated that "there are two positions to this issue" and did not state that students could take a qualified position. However, this did not prevent a number of students from taking qualified positions in their writing.

Teachers also indicated that, in some cases, students' planning did not relate to their writing. Once students began writing, they either forgot about the plan or found going back and forth to the planning pages inconvenient. This is common practice for students. The teacher-readers suggested that a tear-out sheet should be provided for the written response so that students could make better use of planning.

Section 9
Age 9 Achievement

Methods of improving the current assessment program have been explored over the last few years. One of the methods under investigation has been to assess a particular age group of students rather than particular grade levels. In 1993, in order to collect age-based information about student achievement in Language Learning, a special study to sample nine-year-olds in grades 2, 3, and 4 classrooms was undertaken.

Key questions that guided the design of this study included:
- What level of performance do nine-year-old students demonstrate in reading and writing?
- How do levels of performance compare between students of the same age but different grades in school?
- What are some of the administrative concerns related to age-based assessment?
- Do teachers support age-based assessment?

Design
Both the reading and writing components of the Age 9 assessment were the same as the Grade Level 3 Language Learning assessment.

The written component was marked using a levels-based scoring guide. The reporting categories (Content and Development, Use of Language, and Conventions) were the same as those used for the regular Grade Level 3 assessment. However, the five scales were as follows:
- May Be Beyond Grade Level 4
- Grade Level 4
- Grade Level 3
- Grade Level 2
- Not Yet At Grade Level 2

The specific criteria outlined in each level were directly related to the descriptors found at the various levels in the Language Learning component. A sample of papers from students aged 9 and in Grade Level 3 were included in the design. The papers were marked a second time for this study using the levels-based scoring guide.

Methodology
A total of 1 032 students from 29 schools participated in the Age 9 study. Schools were chosen randomly and reflected a provincially representative sample. The number of students from grades 2, 3, and 4 classrooms in the Age 9 sample was in the same proportion as the number of Age 9 students in each grade for the province overall.

School principals were contacted by phone to confirm administrative procedures and to collect an accurate count of students in their school who would be nine years of age and not in Grade Level 3 on the date the assessment was administered.

Both the reading and writing components of the Age 9 assessment were administered at the same time and followed the same administration procedures as the Grade Level 3 Language Learning assessment.

Results
The findings of this study are discussed in conjunction with the key questions that guided the project design:
- **What level of performance do nine-year-old students demonstrate in reading and writing?**

The students' performance in reading and writing was scored according to level of performance. Provincial results are shown in tables 9-1, 9-2, and 9-3.

Table 9-1
Age 9 Study, Language Learning
Percentage of Students Achieving Level of Performance on Both Components of the Test
June 1993

Level of Performance*	Reading Component	Writing Component
May Be Beyond Grade Level 4	18.7	5.9
Grade Level 4	25.6	20.0
Grade Level 3	31.6	35.9
Grade level 2	16.5	29.0
Not Yet At Grade Level 2	7.6	9.1

*Level of performance in this context refers to one of the seven grade levels outlined in the Language Learning component of the Program of Studies (revised 1993).

The highest percentage of students in the Age 9 sample demonstrated performance at Grade Level 3, with fewer students demonstrating performance at Grade Level 2 and Grade Level 4. Overall, performance level of Age 9 students was higher in reading than in writing.

Table 9-2
Age 9 Study, Language Learning
Percentage of Students Achieving Level of Performance by Grade
Reading Component
June 1993

Grade	Number of Students	Not Yet at Grade Level 2	Grade Level 2	Grade Level 3	Grade Level 4	May Be Beyond Grade Level 4	Total
2	13	61.5	23.1	15.4	0.0	0.0	100.0
3	495	10.1	23.3	31.9	21.6	13.1	100.0
4	524	3.8	10.1	31.7	30.0	24.4	100.0
TOTAL	956	7.1	15.4	30.9	26.8	19.6	100.0

Table 9-3
Age 9 Study, Language Learning
Percentage of Students Achieving Level of Performance by Grade
Writing Component
June 1993

Grade	Number of Students	Not Yet at Grade Level 2	Grade Level 2	Grade Level 3	Grade Level 4	May Be Beyond Grade Level 4	Total
2	13	69.2	30.8	0.0	0.0	0.0	100.0
3	495	12.1	32.3	36.8	15.6	3.2	100.0
4	524	4.8	25.8	36.0	24.8	8.6	100.0
TOTAL	956	8.3	29.0	35.6	20.8	6.1	100.0

- **How do levels of performance compare between students of the same age but different grades in school?**

Tables 9-2 and 9-3 indicate that student performance does appear to be related somewhat to grade level; that is, nine-year-olds in Grade Level 4 demonstrated higher levels of reading and writing than nine-year-olds in Grade Level 3. Similarly, nine-year-olds in grade levels 3 and 4 performed at higher levels than nine-year-olds in Grade Level 2. However, a high percentage of students still did not achieve an acceptable level of performance for the grade they were in. Of students in Grade 2 classrooms, approximately 62% did not achieve at Grade Level 2 in reading and 69% did not achieve at Grade Level 2 in writing. Of Grade 3 students, 33% did not achieve at grade level in reading and approximately 44% did not achieve at grade level in writing. Approximately 45% of the students in Grade 4 classrooms did not perform at grade level in reading; 66% of them achieved below grade level in writing.

It is unclear whether the differences among grades are due to promotion policies and the type of instruction provided for students who are retained, to the number of years students have been in school, to grade-specific curricula being taught, or to other factors.

- **What are some of the administrative concerns related to age-based assessment?**

Findings from the administration of the Age 9 assessment showed few reactions to the concept of age-based assessment. Only one principal expressed a concern about administering the assessment to only some students from classes organized by grade.

- **Do teachers support age-based assessment?**

The 150 teachers who marked the Grade Level 3 compositions were asked if they would support provincial assessments for nine-year-olds instead of for Grade Level 3 students. Only 23% of those teachers were in favour of a move toward age-based assessment. Most expressed concerns about pulling a sample of students away from their regular classes and teachers.

Teachers who marked the Age 9 writing component were generally positive about the levels-based scoring guide that was used.

Concluding Comments

Through this study, we learned that it is possible to conduct age-based assessment. However, the approach does not correspond to the administrative structure that currently exists in schools. Administration of age-based assessment, given the nature and purpose of the provincial Achievement Testing Program, can be disruptive, and the assessment does not provide teachers, administrators, and parents with information that is most useful to them. These findings will contribute to the planning and structuring of future assessments.

Appendix A

Standards

The move toward a results-based curriculum has re-emphasized the need for a clear delineation of standards and their purpose. All standards and all methods of setting standards require judgment.

> The process of setting a standard can be only as good as the judgments that go into it. The standard will depend on whose judgments are involved in the process. In this sense, all standards are subjective. Yet, once a standard has been set, the decisions based on it can be made objectively. Instead of a separate set of judgments for each test-taker, you will have the same set of judgments applied to all test-takers. Standards cannot be objectively determined, but they can be objectively applied.[1]

Definitions

The Achievement Testing Program is directly concerned with three different but related standards. These provincial standards are curriculum standards, achievement standards, and assessment standards.

- **Curriculum Standards** are the expected student learnings sequenced into grade levels. They include broad statements of knowledge, skill, and attitude expectations against which student performance is judged. These standards are established in the process of curriculum development and are found in the *Program of Studies* document produced for each course.
- **Achievement Standards** are judgments that specify what percentages of students are expected to achieve an acceptable and an excellent level of performance in relation to each course of studies, i.e., the relevant curriculum standards. It is important to point out that this judgment is not a prediction of the percentage of students who will actually achieve acceptable or excellent levels of performance but rather is a specification of the percentage of students at a given age or grade in school who are *expected* to achieve an acceptable or excellent level. These standards apply to school, jurisdiction, and provincial performance.
- **Assessment Standards** are the criteria adopted for judging actual student achievement relative to curriculum standards. They are ultimately expressed and applied as test scores. They are derived from answers to questions such as:

  What scores must a student obtain or how many questions on a given test must a student answer correctly in order for his/her performance on the test to be judged as acceptable or excellent?

  These standards apply to individual student performance.

Indirectly, the Achievement Testing Program influences *local targets*.

- *Local Targets* are the objectives set in schools and jurisdictions to assist students in moving toward or exceeding the provincial assessment standards. These *local targets* reflect the specific needs of individuals and groups within a specific community.

The Student Evaluation Branch is responsible for establishing and reporting the provincial assessment standards and shares responsibility with the Curriculum Branch for establishing provincial achievement standards as they relate to the Achievement Testing Program.

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[1] *Passing Scores;* Samuel A. Livingston, Michael J. Zieky; Educational Testing Service, 1982.

Purpose

The purpose of defining standards, and the subsequent process of setting the provincial assessment standard within the sphere of the Achievement Testing Program, is to answer questions such as:

- What is *acceptable* and *excellent* performance in relation to the curricular expectations for students at the age or grade being tested?
- What percentages of students at the age or grade being tested ought to achieve an *acceptable* and *excellent* level, assuming adequate teaching and resources?
- What scores on a specific test shall reasonably represent *acceptable* and *excellent* performance respectively?
- What are the prevailing strengths and weaknesses of Alberta students in relation to the curriculum being tested?

In essence, for each test and level of performance, the assessment standards setters are challenged to answer the question:

What score must a student obtain or how many questions must a student answer correctly to be judged as having achieved an acceptable or excellent standard?

Satisfactory performance is demonstrated when the percentage of students scoring at or above the assessment standards is equal to or greater than the achievement standards.

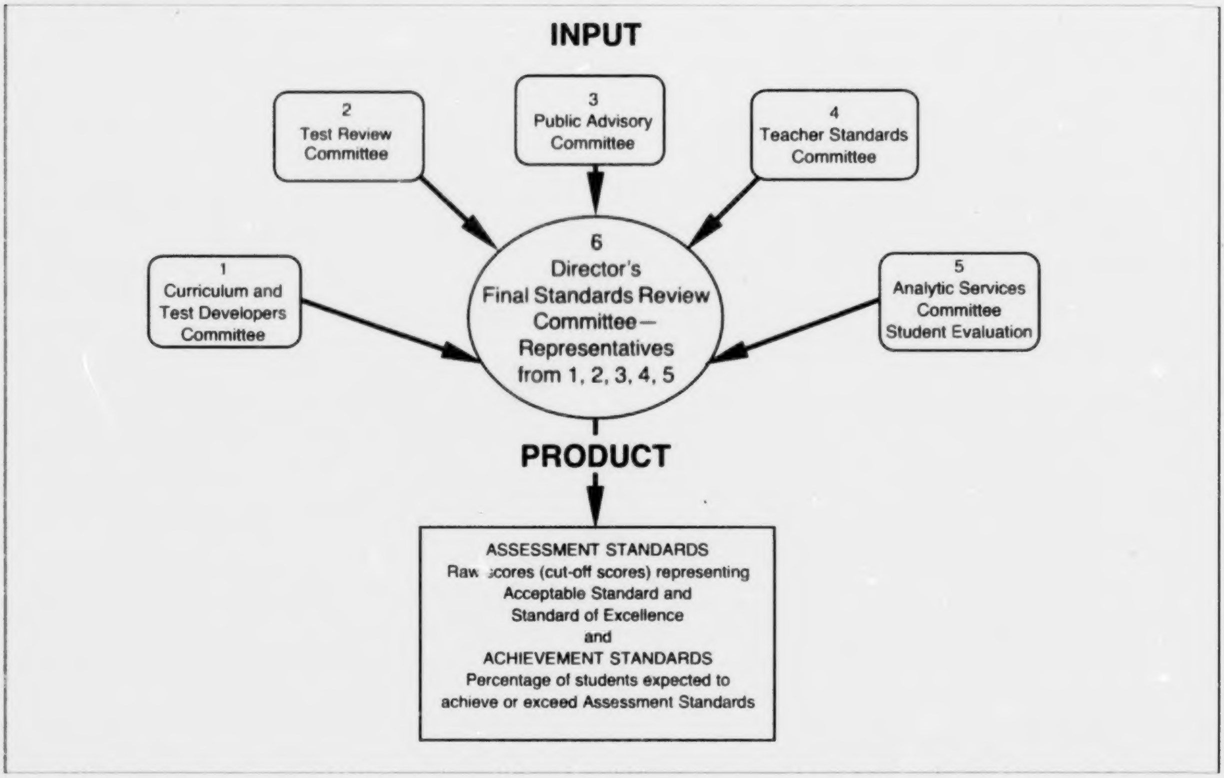
In this report, tables in sections 2, 3, 4, and 9 dealing with standards show what percentage of students achieved standards on each major component and on the total test.

The Assessment Standard-Setting Process

Figure A-1 shows the model established in 1991 by the Student Evaluation Branch to set standards for achievement tests. **The objective was to widen the process of setting assessment standards as much as possible over previous years and especially to provide for community input and feedback.** The process involves individuals and groups making judgments that contribute to establishing the assessment and achievement standards.

Except for the members of the Public Advisory Committee, the members of all committees outlined in Figure A-1 are expected to be highly knowledgeable about both the curriculum and the learning characteristics of the students who are writing the tests.

Figure A-1
Process Model for Standard Setting
Achievement Testing Program
June 1993


INPUT
2 Test Review Committee
3 Public Advisory Committee
4 Teacher Standards Committee
1 Curriculum and Test Developers Committee
6 Director's Final Standards Review Committee— Representatives from 1, 2, 3, 4, 5
5 Analytic Services Committee Student Evaluation
PRODUCT
ASSESSMENT STANDARDS
Raw scores (cut-off scores) representing Acceptable Standard and Standard of Excellence
and
ACHIEVEMENT STANDARDS
Percentage of students expected to achieve or exceed Assessment Standards

1. Curriculum and Test Developers Committee
There is one Curriculum and Test Developers Committee for each achievement test. The committee consists of Alberta Education consultants, curriculum developers, and test development specialists. Their objective is to recommend assessment standards to the Final Standards Review Committee. They may also review and make recommendations on Achievement Standards.

2. Test Review Committee
There is one Test Review Committee for each achievement test. Experienced and knowledgeable educators—teachers, superintendents, university professors, and Alberta Education consultants—meet with the developers of each test. Their purpose is to review the test and make recommendations for improvements where necessary. In addition, the committee reviews the appropriateness of current course achievement and assessment standards.

3. Public Advisory Committee
A Public Advisory Committee, composed of representatives from the general public, met again in 1993 and discussed standards. See Appendix B for more information on the proceedings of this committee.

4. Teacher Standards Committee
Approximately 20 experienced teachers from different areas of the province are selected to sit on a Teacher Standards Committee for each test. To be selected for a committee, a teacher must have been teaching in the grade and

subject area for the previous two years. At present, the procedures used to aid teachers in setting the assessment standards are the modified Angoff method for Mathematics and Science subjects and the Nedelsky method for Humanities subjects.[2] The teachers make judgments about appropriate assessment standards and recommendations to the Final Standards Review Committee. As well, they review Achievement Standards for appropriateness.

5. **Analytic Services Committee**
The Analytic Services Unit of the Student Evaluation Branch is the professional quality control and advisory group for the complete process of standard setting. There is a committee of professionals in psychometrics and statistics for each test. A critical function is to ensure that Alberta Education's standard-setting procedures produce technically valid results that meet the strict requirements of high quality professional studies. The committee makes recommendations for assessment standard-setting procedures, leads individual group discussions, and recommends improvements where necessary. Another function is to determine, independently, assessment standards through statistical analyses of current student achievement data.

6. **The Final Standards Review Committee**
The Final Standards Review Committee consists of representatives from the above committees and is chaired by the Director of Student Evaluation. In separate sessions, the recommendations of all test committees are presented and, through consensus, final Assessment Standards are adopted for each test.

1993 Assessment and Achievement Standards

Tables A-1 to A-3 show the assessment and achievement standards adopted in June 1993 by the Final Standards Review Committee for the grades 3, 6, and 9 achievement tests. The tables also show the percentages of students achieving provincial assessment standards.

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[2] "A Consumer's Guide to Setting Performance Standards on Criterion-Referenced Tests," Ronald A. Berk: Review of Educational Research, Spring, 1986, Volume 56.

Table A-1
Grade Level 3 English Language Learning
Assessment and Achievement Standards
June 1993

Category	Standard of Excellence		
	Provincial Assessment* Standard (Raw Score)	Percentage Achieving Assessment Standard	Provincial Achievement** Standard (%)
Total Test	79/100	14.1	15
Writing Skills	15/20	14.5	15
Reading Skills	33/40	28.8	15

Category	Acceptable Standard		
	Provincial Assessment* Standard (Raw Score)	Percentage Achieving Assessment Standard	Provincial Achievement** Standard (%)
Total Test	48/100	82.2	85
Writing Skills	9/20	81.3	85
Reading Skills	19/40	82.2	85

*The Provincial Assessment Standard is a score determined by appropriate standard-setting procedures and is the lowest score a student must achieve for his/her performance to be judged acceptable or excellent in relation to curricular expectations.

**The Provincial Achievement Standard refers to the percentage of students expected to meet the Provincial Assessment Standard.

Table A-2
Grade 6 Social Studies
Assessment and Achievement Standards
June 1993

Category	Standard of Excellence		
	Provincial Assessment Standard (Raw Score)	**Percentage Achieving Assessment Standard**	**Provincial Achievement Standard (%)**
Total Test	80/100	8.0	15
Skills	50/64	6.2	15
Knowledge	20/24	28.7	15

Category	Acceptable Standard		
	Provincial Assessment Standard (Raw Score)	**Percentage Achieving Assessment Standard**	**Provincial Achievement Standard (%)**
Total Test	49/100	80.8	85
Skills	30/64	77.2	85
Knowledge	13/24	83.5	85

Table A-3
Grade 9 Science
Assessment and Achievement Standards
June 1993

Category	Standard of Excellence		
	Provincial Assessment Standard (Raw Score)	**Percentage Achieving Assessment Standard**	**Provincial Achievement Standard (%)**
Total Test	52/65	17.1	15
Skills	23/29	21.5	15
Concepts	29/36	19.3	15

Category	Acceptable Standard		
	Provincial Assessment Standard (Raw Score)	**Percentage Achieving Assessment Standard**	**Provincial Achievement Standard (%)**
Total Test	33/65	77.6	85
Skills	15/29	74.8	85
Concepts	18/36	80.3	85

Appendix B

Public Review of Standards and Results

On July 21 and 22, 1993, representatives of seventeen business, professional, and community organizations reviewed achievement test results and discussed standards. This meeting was planned to ensure that input from groups representing "public" interests would be considered in the overall reporting of results. The purpose of the meeting was to gather direct public input into the question:

> How well should Alberta students achieve in Grade Level 3 Language Learning, Grade 6 Social Studies, and Grade 9 Science?

The two-day meeting was designed to collect information that would contribute to a better understanding of how well Alberta students are doing. This was accomplished by exploring and discussing answers to four questions. Each question is listed below, along with the results of the discussions.

Question:

What do members of the public expect students to know and be able to do in Grade Level 3 Language Learning, Grade 6 Social Studies, and Grade 9 Science?

For each subject area, participants listed the knowledge and skills that they felt were important learnings for students to achieve at each grade level.

The following learnings were highlighted by the group as important:

Language Learning 3
Students should:

- know how to organize their writing using a prompt
- know how to work cooperatively
- know the correct use of sentence structure, spelling, paragraphing, grammar
- be able to synthesize/draw conclusions/make generalizations
- be able to interpret what they read/see
- be able to follow directions
- be able to determine general word meanings and main ideas
- be able to relate experience/imagination to the written word using appropriate vocabulary.

Social Studies 6
Students should:

- know how government works
- know the difference between needs and wants
- know how to debate
- be able to articulate a position and present supporting arguments
- be able to organize thoughts

Science 9
Students should:

- know the scientific method
- know general science concepts (facts and relationships)
- know how science impacts on society
- be able to manipulate formulas and variables
- be able to use process skills
- be able to apply their mathematics background
- be able to demonstrate scientific literacy

Question:

How closely do the public expectations about student learning relate to provincial standards?

Participants reviewed the 1993 Language Learning, Social Studies, and Science tests. There was essentially a "match" between the public expectations of what students should know and be able to do and the knowledge and skills needed to answer the questions in each of the tests.

Participants were pleased with the variety of testing methods (numerical response, visuals, performance-based assessment) used to provide information about student achievement.

Participants expressed concern that the prompt for the Social Studies 6 written component may have provided students with extraneous information and therefore confusing rather than clarifying the assignment for them.

Question:

How well did students actually perform on the achievement tests?

Participants identified questions in the test that corresponded to knowledge and skills they felt were most important for students to learn. In addition, they discussed the percentage of students in Alberta that **should** answer each question correctly to meet provincial standards. Results showing how well students **actually** performed on these questions were also presented to the group. As well, an initial analysis of the composition component of the Language Learning and Social Studies test was presented.

In each area, students achieved some of the expectations participants set for specific learnings. For other learnings, achievement was below expectations. These areas are listed below.

Language Learning 3
Met Standards:

- be able to use background knowledge/experience
- understand main ideas, key details
- be able to express ideas in a coherent written form
- be able to draw conclusions, make generalizations.

Below Standards:

- be able to recognize and interpret word meanings
- be able to make judgements/interpretations

Social Studies 6
Met Standards:

- know basic concepts
- be able to identify geographical relationships
- be able to synthesize/interpret information

Below Standards:

- be able to differentiate between facts and opinion
- be able to evaluate information
- be able to apply knowledge in a global sense
- be able to take and support a clear position in written form.

Science 9
Met Standards:

- know scientific processes (fluid systems, buoyancy, gravity)
- be able to interpret graphs and diagrams
- be able to analyze and evaluate given information

Below Standards:

- know scientific terms
- be able to apply knowledge to new situations

Question:

Did the group feel that students' performance on the achievement tests was good enough?

Language Learning 3
Generally, participants felt that actual student performance met what they felt was an acceptable standard.

They did feel, however, that the students in the category "approaches the acceptable standard" should not be forgotten about. These are the students we need to focus on next to bring them up to an acceptable level. Our ultimate goal is to have 100% of our students achieve the acceptable level.

Social Studies 6
Most participants did not feel that students' performance is good enough.

The biggest problem seemed to be that standards are too low. Also, there are not enough students achieving the *acceptable standard* or the *standard of excellence*.

Science 9
Committee members were almost evenly split between "yes" and "no" responses to the questions of whether student performance was good enough.

Students generally met the committee's expectations, but participants acknowledged that there was still room for improvement. As well, there were differences in personal views regarding the level of scientific knowledge being assessed at Grade 9.

Other Comments from Participants

Several other comments were made. All members of the committee had an opportunity to provide feedback regarding the organization and activities of the two-day meeting. Their comments are summarized below:

- All participants supported the use of a variety of testing methods, such as numerical-response questions, visuals, and performance-based assessment, in allowing a greater degree of success for more students.
- Many participants suggested that testing should begin at a relatively early age so that there is time to respond to any problems that may show up.
- Participants felt that test scores are affected by a variety of factors, including attitude (motivation) and curriculum demands.
- Many participants agreed that the Student Evaluation Branch needs to continue to address test bias, especially in relation to Native culture.
- Participants indicated that this type of "public meeting" activity should continue, possibly on a broader scale.

A Final Note

The views of participants regarding the achievement of Alberta students were used to help set the assessment standards for the 1993 achievement tests.

A more detailed report on the 1993 meeting was distributed to participants and is available upon request. Please contact Yvonne Johnson at 427-0010 to obtain a copy of this report.

The next meeting for public review of achievement standards will be in July 1994.

Appendix C

Guidelines for Interpreting Results

Jurisdiction and School Reports

The jurisdiction and school reports describe the results achieved by students who wrote achievement tests in Grade Level 3 Language Learning, Grade 6 Social Studies, and Grade 9 Science in June 1993. These reports include provincial results and allow school board members, superintendents, principals, and teachers to compare jurisdiction and school results with provincial standards and levels of achievement.

To decide if the achievement of their students is "good enough," educators at the school and jurisdiction levels can compare their results to:

- provincial standards
- local targets for student achievement
- the achievement of students throughout the province of Alberta
- school and jurisdiction results from the last provincial administration of tests in these subjects in 1989

Use of the Jurisdiction and School Reports

The Achievement Testing Program is designed primarily to provide group results. However, individual student results are provided to schools and may be used in conjunction with other information to plan individual programs for students. Also, parents are entitled to know how their child did on the test. As required by regulation, each student's results must be included in the student's school record file.

The test results are not intended to be used as a basis for:

- making decisions about student placement or promotion
- evaluating teacher performance
- comparing performance between or among schools

The interpretation of results from the achievement tests involves considering the many factors that contribute to achievement. Although the tests are designed to assess provincial standards as reflected in the general learner expectations of the *Program of Studies*, many important aspects of learning cannot be measured by time-limited, paper-and-pencil tests.

Standards

Achievement tests and the school and jurisdiction reports are designed to provide information about how well students are doing compared to established standards. Two standards are set for each achievement test. The *Provincial Assessment Standard* is the lowest score a student must achieve for his or her test performance to be judged "acceptable" or "excellent" in relation to curricular expectations. Standards for "excellent" and "acceptable" were set for the total test and for the two major components of each test.

Provincial Achievement Standards specify the percentage of students expected to meet the assessment standards.

Table 2 in the school and jurisdiction reports shows the assessment and achievement standards for the two components of each test and for the total test, together with the number of students who met the standards. The table also shows whether the number of students in that school or jurisdiction who have achieved the standards is significantly different from the expected number. A difference is reported as significant when there is a 5% or smaller probability that a difference of that size could occur by chance. For schools and jurisdictions with fewer than five students, significance was not calculated.

Although the statistical tests take the number of students into consideration, results for groups of fewer than 25 students must be interpreted with particular caution.

Achievement-Over-Time-Study

Some schools participated in a study of changes in achievement over time. Students in these schools were randomly assigned to one of three alternative forms of the achievement test for their grade. Two forms included items from the tests used in the same subjects in 1985 and 1989, as well as some items from the 1993 test. The third form was identical to the 1993 test. A full explanation of the design and the results of the study are included in this Provincial Report.

To treat all students in an equitable manner, scores on the alternative forms were equated so that students receive a mark equivalent to one they would have received if they had written the 1993 test. This means that the results for all students are included in most tables.

For those schools and jurisdictions that participated in the study, multiple-choice results by reporting category and individual student subscale scores are presented in separate tables for each form.

Also, tables that refer to frequency distributions for individual multiple-choice and numerical-response questions are different for schools participating in the study. For non-participating schools, these tables include distributions for the 1993 items only. Provincial results in these tables for 1993 items differ slightly between the reports for schools in the study and those not in the study. This is because the provincial results for the non-participating schools are based only on the responses of students writing the 1993 test, whereas for participating schools results for 1993 items appearing on the 1985 and 1989 forms of the test are also used. For schools participating in the achievement-over-time study, distributions are provided for items that appear on all forms.

Results for Individual Multiple-Choice Questions

The responses to each item may total less than 100% because some students did not answer some of the questions.

Grade Level 3 Language Learning

The written-response section of the Grade 3 Language Learning Achievement Test was scored on three scales. To calculate the total score on the written-response section, a student's score on the first scale (Content and Development) was multiplied by two and added to the scores achieved on the other two scales (Use of Language and Conventions). Thus, the total possible score for written-response is 20. The reading and writing components of the test were given equal weighting in calculating the total test score. To calculate a student's total score, the written-response score was multiplied by 50/20, the reading score was multiplied by 50/40, and the two scores were added to give a total score out of 100.

Grade 6 Social Studies

Analysis of the student responses to multiple-choice items on the Grade 6 Social Studies Achievement Test revealed problems with five items. Three items were deleted from the test (22, 33, and 45), and two items (9 and 49) had two correct answers in the possible responses and were marked right for both answers. None of these items was used for the achievement-over-time study; thus, the regular form and Form F had 47 multiple-choice items and forms D and E had 50 multiple-choice items.

All forms of the test had the same written-response assignment. This section was scored on two scales. To calculate a total score for the written-response section, the score awarded on the first scale (State and Support an Opinion/Position) is multiplied by two and added to the score awarded on the second scale (Quality of Language and Expression). The maximum possible score is 15 for written response.

The two major reporting categories for the test are knowledge and skills. The knowledge score is based on multiple-choice items only. The skills score is a weighted combination of multiple-choice and written component scores.

Total test scores were calculated according to the formula indicated in the following table.

Test Form	Number of Multiple-Choice Questions (70% of Total)		Multiple Choice Weighting Factor	Written Response (30% of total)	Total = (multiple-choice score) × weighting factor + 2 × written response
	Knowledge	Skills			
Regular and Form F	24	23	70/47	15	100
Form E	20	30	70/50	15	100
Form D	25	25	70/50	15	100

Because the knowledge component consists entirely of scores on multiple-choice items, the knowledge scores are reported as unweighted raw scores. When scores on forms E and D are equated to the regular form, the equated knowledge scores have the same maximum score as the regular form; that is, 24.

The skills component includes both multiple-choice and written-response questions, and is reported only as a weighted combination. The maximum score on the skills component for the regular form and Form F is 64. For Form E, the maximum score is 72; for Form D, it is 65. When scores on forms E and D are equated to the regular form, the equated skills scores have the same maximum score as the regular form; that is, 64.

Comparing Results to Average Scores

To determine if students are "doing well enough," achievement tests are developed in reference to curriculum criteria with established achievement and assessment standards. Consequently, most attention is given to comparing achievement with standards.

However, in addition to including the percentage of students meeting standards in school and jurisdiction reports, each report also provides jurisdiction or school average scores for each reporting category or subtest. Comparisons of each of these scores to the provincial average for the same reporting category or subtest can help determine relative strengths and weaknesses of the school or jurisdiction compared to results achieved provincially.

Evaluating the importance of and reasons for differences between jurisdiction or school averages and provincial averages requires careful consideration of the practical significance of differences. Also it is important to consider local targets for student achievement relative to *Provincial Achievement Standards* and averages.

Factors Limiting the Interpretation of Test Results

Educators who are interpreting results must take into account the following limitations:

1. Paper and pencil tests necessarily measure reading achievement in the content area being tested. Standards built into each achievement test reflect the reading level expectation for the grade level tested. Jurisdictions should consider the average reading level of their grades 3, 6, and 9 students, as reading levels below these grades will have an effect on test results.
2. If more than 10% of eligible students in a jurisdiction did not write a test, the reported statistics for that jurisdiction may not accurately represent the true level of achievement.

School Factors Which Affect Student Achievement

Research* in education has identified key aspects of school effectiveness which affect student achievement:

1. Productive School Climate and Culture
   - there is a shared and articulated focus on achievement
   - there is a shared belief that all students can achieve
   - staff is cohesive, collaborates, and makes decisions by consensus
2. Focus on Student Acquisition of Central Learning Skills
   - teachers know what students are to learn and emphasize mastery of key concepts
   - students know what is expected of them
   - learning time is maximized
3. Appropriate Monitoring of Student Progress
   - students can show what they have learned
   - parents know what their child has achieved
4. Outstanding Leadership
   - effective instructional leadership is provided
5. Parent Involvement
   - high levels of school and home cooperation are evident
6. Effective Instruction
   - grouping and organizational arrangements are appropriate
   - pacing is appropriate
   - curriculum and learning are aligned
   - teachers use a variety of strategies
   - students are actively involved
7. High Expectations and Requirements for Students
   - students are held responsible for learning
   - higher order learning is emphasized

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*Haertel, Geneva D. et al. (1990) "What Influences Learning? A Content Analysis of Review Literature," *The Journal of Educational Research*, Vol. 84(1), 30-43
Levine, Daniel U. & Lezotte, Lawrence W. *Unusually* Effective Schools (National Center for Effective Schools Research & Development, Madison, WI: 1990)

Many contextual aspects can be considered in interpreting results and planning for improved learning. These include students' abilities, attitudes, motivations, aspirations, academic backgrounds, and learning styles. They also include students' family circumstances, socioeconomic backgrounds, and community environments.

A Systematic Approach for Effectively Using Test Results

Educators can use achievement test results constructively as one means of improving the quality of education. It is desirable to involve all those affected by achievement tests, including teachers, parents, and community members, in the analysis of test results. A systematic use of the test results includes the following steps:

1. Evaluating the percentage of students who wrote the achievement tests (participation rate) for your school or jurisdiction. If your participation rate varies greatly from the provincial participation rate, you should consider the degree to which your results reflect achievement in your school or jurisdiction.
2. Comparing test results to province-wide standards. Comparisons should include results for both major components, gender, age, and levels information. Provincial results are provided so that you can see how the whole province compares to these same standards.
3. Examining the results of multiple-choice and numeric-response questions. These individual question results provide an opportunity to assess how well your students mastered specific curriculum standards.
4. Examining the results of written-response scoring categories.
5. Noting any patterns, anomalies, and/or interrelationships in the results.
6. Hypothesizing relationships between your observations and the factors affecting achievement in your school or jurisdiction.
7. Developing and implementing a plan to improve the quality of education for students.
8. Communicating to parents the results of achievement tests and what the school is planning to do to improve student achievement.

Appendix D
Reporting to Parents: Answers to Frequently Asked Questions

What are the achievement tests?
The achievement tests are provincial government tests administered in Alberta schools to students in language arts/language learning, social studies, science, and mathematics.

What is the purpose of the achievement tests?
The achievement tests help Alberta Education to communicate provincial expectations and results for levels of student performance in language arts/language learning, social studies, science, and mathematics. The tests enable Alberta Education to monitor the level of achievement of students throughout Alberta. The results also help local school boards, principals, and teachers identify the strengths and weaknesses in their implementation of these programs.

How many achievement tests will my child have to write?
In 1993, students wrote only one test in Grade 3 English Language Learning, one in Grade 6 Social Studies, and one in Grade 9 Science. In 1994, the program will assess Grade 3 students in mathematics, Grade 6 students in science, and Grade 9 students in language arts.

How should I prepare my child to write an achievement test?
No preparation beyond normal classroom instruction is required to write an achievement test. While students should be encouraged to do their best, a good night's sleep and a relaxed, confident approach to testing are the best possible preparation.

How much do these tests count for my child?
The achievement tests do **not** affect students' final marks. The classroom teacher is responsible for evaluating students and awarding final marks. Achievement test results are not released by Alberta Education until September, long after students' marks have been determined by the classroom teacher.

How do achievement test results help classroom teachers?
Achievement test results provide feedback on student achievement to school boards, principals, and teachers. For example, teachers in a school where student performance is high in one skill area but low in another may wish to examine their programs to see if changes are needed to achieve a better instructional balance.

What are the limitations of the achievement tests?
Paper and pencil tests cannot easily measure such things as laboratory skills, small group discussions, and creative thinking. Thus, some student strengths can be evaluated only by the classroom teacher. Also, a single test cannot reveal as much about a student's development and growth as can evaluation by the classroom teacher over the course of a full school year.

What advantage do achievement tests have over other standardized tests?
Unlike commercially developed tests, achievement tests are based on learning expectations and standards communicated through Alberta's programs of study. The tests are designed, written, and evaluated by experienced classroom teachers from across the province. Tests developed elsewhere may not reflect curriculum or standards appropriate for Alberta.

How do I interpret achievement test results?
The *Achievement Testing Program Provincial Report* includes guidelines for interpreting results. Readers are cautioned not to overgeneralize conclusions based on a single administration of the test. Results should be compared with expectations or with the results of previous achievement tests in the same subject. Any trends that are observed in the scores must then be interpreted in the context of a variety of factors that could affect student achievement.

Comparisons between districts, schools, or classrooms are likely to prove misleading and are therefore discouraged.

Can I find out how my child did on the achievement test?
Yes, by contacting the school where your child wrote the test. Individual results on the achievement tests are made available to school principals in the fall. Since the tests are designed to gather information on groups of students, not on individuals, individual results must be interpreted with caution. Schools are expected to share their results with parents and the local community and discuss follow-up plans for improvement. A copy of the school report (without the individual student scores) should be available.

Where can I get additional information about the Achievement Testing Program?
Bulletins describing the content of the coming year's achievement tests and the Provincial Report describing the results of the previous year's testing are distributed to schools each year. Requests for copies of these publications or questions and comments regarding the Achievement Testing Program should be directed to:

Mr. Dennis Belyk
Assistant Director
Achievement Testing and
Diagnostic Evaluation Programs
Student Evaluation Branch
Alberta Education
Devonian Building, West Tower
11160 Jasper Avenue
Edmonton, Alberta T5K 0L2

Appendix E

Developing Achievement Tests

The Student Evaluation Branch develops achievement tests that measure student achievement at the grades 3, 6, and 9 levels. Province-wide testing in language arts/language learning, mathematics, science, and social studies follows a four-year cycle for each grade level and subject. Many individuals and groups are involved in the development of each test: practising classroom teachers, school and central office administrators, and representatives of post-secondary institutions, the Curriculum Branch, the Language Services Branch, Regional Offices, and the Student Evaluation Branch. Student Evaluation Branch staff ensure the development of valid and reliable tests.

The following is a summary of the phases of the test development process:

- Planning
- Approving Blueprints
- Developing Test Questions
- Constructing and Administering Field Tests
- Analyzing and Revising
- Constructing Final Field Tests
- Approving Final Field Tests
- Administering Final Field Tests
- Constructing the Final Test
- Preparing and Administering the Final Test
- Marking
- Analyzing and Reporting the Results

Under normal circumstances, it takes three years to complete all phases of the process.

Planning

Test developers ensure that the design of each achievement test reflects the learning expectations in the *Program of Studies* for each subject. Planning takes into consideration those parts of the program that are testable in a paper and pencil format, within a given time frame. Teachers and consultants from across the province assist in preparing the design of each test.

Test developers prepare an interim test blueprint (an overall plan used to guide the development of a test). Questions that must be addressed at this point are:

- What knowledge, skills, and attitudes should students be expected to demonstrate?
- What types of questions will constitute the test (machine-scored, short answer, or extended written response)?
- What weighting will each part of the test be given?
- How long and how demanding should the test be?
- How should the results of the test be organized for reporting purposes?

In order to ensure that each test will produce meaningful and reliable results, test developers incorporate statistical as well as curricular standards in the test design. Statistical standards address areas such as range of question difficulty and the requirements for reporting.

Each dimension of the curriculum for which results are reported must contain at least six questions if the results are to be meaningful.

Approving Blueprints

Blueprint approval establishes the overall design of the test, the exact emphases given to each category for which results are reported, and the emphases given to the different cognitive levels.

The interim blueprint is reviewed by a committee of Alberta Education personnel that represents the Curriculum Branch (or Language Services Branch), Regional Office consultants, and the Student Evaluation Branch. This committee makes recommendations to the Director of the Student Evaluation Branch. The blueprint recommended by the Alberta Education committee is then reviewed by a Test Review Committee, which consists of teachers and members nominated by the Conference of Alberta School Superintendents and post-secondary institutions. This committee makes recommendations to the Director of the Student Evaluation Branch.

Developing Test Questions

Following blueprint approval, committees of practising classroom teachers working at the appropriate grade level are formed, and question development meetings are held. These committees develop new test questions that reflect the learning expectations of the *Program of Studies* and curriculum specifications. Where necessary, question developers are trained in the principles of question construction. Questions built in committee are then screened for format, validity, blueprint "fit", and other design considerations.

Constructing and Administering Field Tests

After careful editing and formatting of questions developed by the teacher committees, field tests are constructed. Any required artwork is completed during this phase of the test development process.

With permission from school and jurisdiction personnel, field tests are sent to a number of teachers throughout Alberta. The students involved are representative of the student population for which the test has been designed. A minimum sample of 150 students writes each field test.

Teachers who administer a field test are asked to comment in writing on the following:

- reading level
- how closely the question matches the way in which a concept was taught
- level of difficulty of the questions
- quality of the questions and graphics
- errors of any kind

The results from the administration of this initial round of field tests are used to validate content, to determine difficulty levels, and to ensure that questions are expressed clearly. Special field tests are also constructed to "try out" new assessment strategies and techniques that may be useful for future assessments.

Analyzing and Revising

The results of each field test are then analyzed and scrutinized to determine whether individual questions require revision. Teacher comments regarding the way that test questions are structured and the way that a subject is being taught are also carefully considered and used to guide revision.

Questions deemed to require changes are revised and submitted for further field testing.

Constructing Final Field Tests

Once the initial field test results are thoroughly analyzed and questions requiring changes are revised, final field tests are constructed. These field tests follow the approved blueprint and parallel the actual achievement test in format and design.
Final field tests, like all field tests, are submitted for further validity checking, editing, and proofreading. In grades 6 and 9, separate tests in English and in French are developed for language arts. At this point, all other tests for Grade 6 and Grade 9 are translated into French.

Approving Final Field Tests

After the final field tests have been constructed, a second meeting of the Alberta Education Committee that represents the Curriculum Branch (or Language Services Branch), Regional Office consultants, and the Student Evaluation Branch is convened. This committee reviews the final field tests and makes recommendations for improvement. The Test Review Committee, which approved the blueprint in Phase Two of the test development process, meets a second time to review and recommend for approval the final field tests and the instructions for administering the tests. If a test includes short-answer or extended-writing questions, the Test Review Committee discusses standards of achievement and marking standards appropriate for the test. Again, this committee makes recommendations to the Director of the Student Evaluation Branch.

Administering Final Field Tests

The final field tests are administered and the results are used as a final screen in selecting questions for placement on the provincial achievement test. A minimum sample of 250 students writes each final field test. The sample is selected to include:

- only students who have received instruction in the course
- students representing a normal distribution of ability levels
- students from rural and urban schools
- students from large and small schools

Constructing the Final Test

The construction of the final test form is based upon information collected from the final field test administration. The Test Review Committee is reconvened to review the final test form and to assist in setting assessment and achievement standards.

The test is submitted for final validity checking, editing, and proofreading. Grade 6 and Grade 9 achievement tests, in subjects other than language arts, are translated into French.

For each test, an information bulletin is prepared that outlines the design and nature of the upcoming tests. These bulletins are distributed to each school at the beginning of the school year to facilitate program and instructional planning by teachers and administrators.

Preparing and Administering the Final Test

The completed achievement test is commercially printed and prepared for distribution. Sufficient copies of the test are mailed to each school. Quantities are based on the number of students enrolled in the subject as reported to the Student Evaluation Branch. The test is administered to students by their classroom teachers.

Marking

All written-response sections of the tests are marked by classroom teachers. These teachers, who are recommended by their superintendents, are currently teaching the course being evaluated, have taught the course for a minimum of two years, and hold a valid Alberta Permanent Professional Certificate.

Student Evaluation Branch staff train and supervise the teachers during the marking sessions. All multiple-choice and numerical responses are machine scored.

Analyzing and Reporting the Results

A results report is prepared and distributed to superintendents, school principals, Alberta Education officials, and other Departments of Education. This report is also made available to the general public. In addition to the *Achievement Testing Program Provincial Report*, each school and jurisdiction receives a statistical summary for its student population.

For further information, please refer to the Achievement Test Bulletins or call the Assistant Director, Achievement Testing and Diagnostic Evaluation Programs, at 427-0010.

1993 Achievement Testing Program Provincial Report

Questionnaire

The Student Evaluation Branch strives to produce documents that are useful to educators and their communities. The purpose of the following questionnaire is to collect your opinions about the *Achievement Testing Program Provincial Report*. All opinions are considered when the content and format of the next report are reviewed. Please take a moment to respond to the questions and send to:

Assistant Director, Analytic Services
Student Evaluation Branch
Alberta Education
11160 Jasper Avenue
Edmonton, Alberta T5K 0L2

Content of the Report

1. Please judge the usefulness of the information included in the various sections of the report by checking the appropriate boxes below.

		Very Useful	Adequately Useful	Partially Useful	Not Useful
Section 1:	Summary of Achievement Test Results	☐	☐	☐	☐
Section 2:	Grade Level 3 Language Learning	☐	☐	☐	☐
Section 3:	Grade 6 Social Studies	☐	☐	☐	☐
Section 4:	Grade 9 Science	☐	☐	☐	☐
Section 5:	Achievement by Gender	☐	☐	☐	☐
Section 6:	Achievement by Age	☐	☐	☐	☐
Section 7:	Achievement by Grade Level	☐	☐	☐	☐
Section 8:	Achievement Over Time	☐	☐	☐	☐
Section 9:	Age 9 Achievement	☐	☐	☐	☐
Appendix A:	Standards	☐	☐	☐	☐
Appendix B:	Public Review of Standards and Results	☐	☐	☐	☐
Appendix C:	Guidelines for Interpreting Results	☐	☐	☐	☐
Appendix D:	Reporting to Parents—Answers to Frequently Asked Questions	☐	☐	☐	☐
Appendix E:	Developing Achievement Tests	☐	☐	☐	☐

Format of the Report

1. Please judge the usefulness of the report's format by checking the appropriate boxes below.

	Very Useful	Adequately Useful	Partially Useful	Not Useful
Organization into Separate Sections	☐	☐	☐	☐
Three-Column Presentation of Text	☐	☐	☐	☐
Presentation of Figures	☐	☐	☐	☐
Presentation of Tables	☐	☐	☐	☐
Blending of Information in Text, Figures, and Tables	☐	☐	☐	☐

Please write on the back of this page if you wish to comment further on the report.